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ABSTRACT

This booklet is one in a series of resource manuals to help teacher educators conduct environmental education (EE) teacher workshops or promote EE programs. The unit is presented in seven sections that describe: (1) a rationale for teaching environmental issues; (2) a five-step process for addressing environmental issues; (3) classroom approaches to environmental issues; (4) decision making, facilitating, critical thinking, and conflict management skills for students and teachers, as well as, characteristics of effective teachers of environmental issues; (5) common barriers teachers face when bringing environmental issues into the curriculum and ways to circumvent them; (6) nine activities for the workshop; and (7) a list of 34 resources for skill building, exploring issues, understanding solutions, making it happens, and organizations to contact. The nine activities make up the majority of the booklet and focus on the value of dealing with issues, skills teachers need as facilitators of students investigating issues, and what teachers can do if they choose one of the three approaches to addressing issues. (MDH)

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EE Toolbox—
Workshop Resource Manual

Approaching Environmental Issues in the Classroom

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The Environmental Education Toolbox

EE Toolbox—
Workshop Resource Manual

Approaching Environmental Issues in the Classroom

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Contents

Introduction 2

I Why Teach Environmental Issues? 3
- A Rationale 3
- A Popular Complaint 4

II A Process for Addressing Environmental Issues 6
- Five-Step Process for Problem Solving 7
- Step 1: Choosing the Issue 8
- Step 2: Defining the Problem 8
- Step 3: Searching for Solutions 9
- Step 4: Evaluating Options 10
- Step 5: Taking Action 10
- Suggestions for Presenting the Five-Step Process 12

III Classroom Approaches to Environmental Issues 13
- 1. Exploring Issues 14
- 2. Understanding Solutions 15
- 3. Making It Happen 17

IV Skills for Students and Teachers 18
- Decision Making Skills 18
- Facilitation Skills 19
- Critical Thinking Skills 19
- Conflict Management Skills 20
- Characteristics of Effective Teachers of Environmental Issues 21

V Common Barriers and How to Circumvent Them 22
- Structural Barriers 22
- Personal Concerns as Barriers 22
- Support Barriers 23

VI Activities and Masters 24

VII Resources 57

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A Field Trip in the Life of Mr. Balakian

As his seventh graders climbed back on the bus after their yearly field trip to the nearby National Forest, Mr. Balakian, the life science teacher, couldn't help but feel a bit uneasy about how he would approach the remaining classroom unit on "The Life of a Forest." Each time he took students on the annual trip to the forest, there was something new to explain. This year, however, he saw a different kind of challenge.

Because this trip was part of a classroom unit on forest plants, the discussion usually centered on tree species, which mushrooms were edible, and the age of certain large trees. This year, because of the interest and concern of one of the students, the questions posed to Mr. Balakian and the Forest Service staff were about clearcuts and their effect on wildlife and the local economies.

Josh, the student, was amazingly well-informed on the local issues and openly challenged the management practices that were part of the tour. He had read that clearcutting might cause silting in local rivers, thereby endangering the salmon. But another student countered that concern for fish was endangering his family because his father worked in a plywood mill. And a third student wanted to know whether the pace of deforestation was faster than the rate of replacement.

The Forest Service employee explained how logging supported the local economy by creating different sorts of jobs for mill owners, truckers, and paper companies, among others. Several of the students got into a discussion that turned predictably emotional: logging and jobs versus fish and nature.

The official tour ended on a civilized note, with the students cordially thanking the tour guide. Now they would return to the classroom to identify the plants they had collected, calculate the size and age of trees, and follow up on their findings in the library. But there were obviously other issues to integrate, ones with which Mr. Balakian did not feel as comfortable. He simply didn't know as much about the social aspects of the forest as the biological ones.

He realized that the issues were complicated and that most of his students didn't have the background to inform their arguments (he wasn't sure that he did either). He knew that time was short just for teaching the basic biology, and addressing these issues might expose him to complaints from parents concerned about "biases." At the same time, he sensed that the current agitation of his class was an opportunity, a "teachable moment." How should he proceed?

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Introduction

MR. BALAKIAN IS NOT ALONE. Educators increasingly face the challenge of incorporating complex, "real-life" issues into their classrooms, whether prompted by curious students or encouraged by education reformers. As many educators point out, teachers like Mr. Balakian can use incidents like this to explore problem solving, critical thinking, and conflict resolution in their classrooms. It takes some planning, creativity, and effort.

Your inservice programs can give teachers ideas, support, and resources for helping students learn more about controversial issues and environmental problems. You can share guidelines for engaging students in a problem-solving strategy around an issue of their choice. Or, you could focus on the facilitation skills that teachers need in order to approach environmental issues in their classrooms.

Your workshop participants may raise some of these questions:

- "Why should (or shouldn't) we include environmental issues in our curricula?"
- "How can we introduce our students to controversial issues without inviting a face-off or angering their parents?"
- "How can we help our students understand and address environmental issues effectively?"
- "What skills do we and our students need to attend to controversial issues?"
- "What things make it difficult to incorporate issues in the classroom? How can we get around those barriers?"

These questions, raised by teachers in workshops such as yours, provide the organizational structure for this unit, which explains:

- the importance of developing a rationale
- a flexible problem-solving process that can be adapted to meet different teaching styles and needs
- strategies to assist students in effectively analyzing, understanding, or taking action on environmental issues
- skills that help teachers and students address controversial issues thoughtfully and responsibly
- common barriers and suggestions for overcoming them

Activities (beginning on page 24) support the main concepts in each section. At the end of the unit is a list of related resources and organizations.

Why Teach Environmental Issues?

THE DEMANDS ON CLASSROOM TEACHERS are heavy, and they are growing. So, why include environmental issues in the classroom experience? A teacher's first step in this process is to identify why environmental issues are important and how the process of addressing them can benefit teaching and learning. As an inservice provider, you can help your workshop participants develop a rationale for incorporating environmental issues into their curricula.

A Rationale

What are the reasons for teaching environmental issues in the classroom? When teachers are given time to consider this question, they have a lot to say. Here is what one group of teachers came up with during a workshop on teaching environmental issues:

Benefits for Students:

- Young people have concerns about the environment, and it is important to respond to their concerns and support them. Investigating actual problems and making an effort to improve those situations engages students and motivates them. The process makes learning relevant to their lives.
- Going through a process of investigation and action can instill optimism, rather than despair, about the future. Students should understand the seriousness of environmental problems but also develop a sense of hope and commitment to change.
- Considering environmental issues and their solutions requires students to practice and improve skills such as decision making, critical reflection, and problem solving. This is particularly true in the context of imperfect or incomplete information. They learn how to apply their skills and knowledge and reconsider their opinions as they build their own world.
- Studying environmental issues can empower young people by connecting their daily lives and local community with their classroom studies. (For background and discussion on this topic, see the EE Toolbox *Workshop Resource Manual* unit on "Using Community Resources.")

Benefits for Teachers:

- Environmental issues are making headlines. They can attract and hold students' interest because they are current, relevant, critical issues of the times.
- Addressing environmental issues involves a variety of activities and learning experiences, thus improving the quality of teaching.
- Involvement in environmental projects develops cooperation and a sense of community among students.
- Environmental issues provide a context for interdisciplinary learning.
- A systematic approach to exploring, analyzing, and solving problems addresses learning objectives that are central to education reform.
- The urgency of environmental deterioration demands that we incorporate environmental issues into the classroom experience.

Building Rationale in a Workshop

It is not realistic to expect every teacher to have a clear rationale at the beginning of a workshop. Often, such clarity comes as a result of having direct workshop experiences. One inservice leader started her workshop by asking participants to write down two or three reasons for teaching environmental issues. Each person shared one idea with the whole group. This initiated the process of developing a rationale and acted as a means for participants to introduce themselves. Later in the workshop, after the participants had a variety of experiences, they constructed personal statements about teaching environmental issues; this allowed them to leave the workshop with a clear statement of their own rationales. Activity 1 offers another possibility for assisting teachers in developing a rationale.

A rationale is like the foundation of a house: everything else is held up by it. When teachers examine their own reasons for addressing environmental issues in the classroom, they are creating stability and direction for their programs; if the going gets rough, they can go back to their rationales for reminders about why they are teaching environmental issues. The strength of a classroom project and the form it takes can directly relate to the clarity of the rationale.

Teachers are likely to raise concerns and barriers to addressing issues in their classroom. Although these are important to discuss and overcome (see pages 22–23), you may prefer to separate purpose and rationale from the barriers. If teachers raise concerns that would seem to argue against addressing environmental issues in the classroom, you may want to list their concerns on newsprint and return to them later in the workshop.

On the other hand, you may need to acknowledge their concerns right away. In one workshop, a teacher commented that our understanding of the problems is always changing—today's facts may be tomorrow's fallacies. Therefore, he wasn't sure that issues belonged in the classroom. Other teachers responded that teachers shouldn't advocate particular positions and that students need to develop hopeful visions for the future rather than notions of helplessness and hopelessness. In their opinion, engaging the students with issues, even if it meant struggling with uncertainty and ambiguity, was more important than waiting for more facts. In addressing their colleague's concern, these teachers reinforced their own rationales.

As teachers develop and discuss their rationales, you may wish to provide a few resources. David Orr writes about the need for ecological literacy in college and university liberal arts programs; his work may be especially useful to high school teachers. Teachers who include the notion of student empowerment in their rationales may find Seth Kreisburg's model of empowering education useful; he describes it in *Transforming Power: Domination, Empowerment, and Education*. Finally, a Toolbox publication called *Getting Started: A Guide for Bringing Environmental Education Into Your Classroom* includes several descriptions of how teachers have addressed issues in their schools, the challenges they overcame, and the benefits they found. (These publications and more are listed in the "Resources" section at the end of this unit.)

A Popular Complaint

As environmental education becomes more popular in schools and a more powerful force in the education community, you may hear one particularly strong criticism: that EE is brainwashing kids to have a knee-jerk environmentalist reaction to issues. We suggest that you discuss this misconception in your workshops.

A key point is that advocacy is not the same as education. A teacher may do both, but they have different purposes. To advocate for a solution or behavior change is akin to telling people what to do, rather than educating them (with information and skills) to make their own choices. Teachers may advocate certain behaviors ("Don't hit kids on the playground" and "Wash your

hands before lunch") to promote social norms or protect students' well-being. Regarding controversial issues, however, an approach that "educates" is often the best route.

This line gets very fuzzy, however, when younger students want to "do something" about the environment and tend to see the world in terms of "good guys and bad guys." It is important to help students understand the complexity of most environmental issues: Americans want things like cars, TVs, and convenience; that desire creates problems like habitat destruction and pollution. Helping students develop the skills and commitment to balance both needs—for a comfortable life and for environmental protection—is the essence of environmental education. (This interesting debate is explored in several articles in the Toolbox's *EE Reference Collection*.)

This approach to including environmental issues in schools is based on the assumption that teachers will help students explore issues and consider alternative solutions, not insist on immediately making newspaper headlines. The procedure in the next section outlines the steps teachers can take to bring issues into the classroom.

Last year in suburban Boise, an elementary school music teacher altered a skit performed by students because she feared it was too controversial to pass muster with her conservative school board. The song she removed had nothing to do with the usual gamut of sticky issues the schools grappled with, such as AIDS or sex education. Rather, it taught the virtues of recycling.

In Laytonville, California, parents campaigned to remove Dr. Seuss's story about the Lorax, who "speaks for the trees," from the second-grade reading list for being anti-logging in a town where the major industry is timber.

And in Broken Arrow, Oklahoma, a fundamentalist Christian group attempted to remove a teacher resource manual on the environment, called Earth Child, from elementary schools. According to the group Oklahomans for Quality Education, the book promoted, among other things, satanism, Eastern mysticism, and worship of the Earth.

Reported by Barbara Ruben in "Reading and Writing, But Not Recycling," Environmental Action, 26(1) pp.19–22.

II

A Process for Addressing Environmental Issues

WHEN YOUR TEACHERS have clarified why they want to incorporate environmental issues in their classrooms, it's time to start looking at how they can do so. To begin this process, they need to recognize some basic characteristics of environmental issues.

- Environmental issues are complex. Their elements and ramifications can be economic, social, cultural, scientific, and political as well as environmental.
- There are usually more than two sides to an issue; often, there are multiple perspectives.
- It takes more than facts to understand environmental issues. It also requires understanding the context, seeing the problem from various perspectives, and exploring possibilities.
- There is rarely only one way to resolve an environmental issue.
- Solving environmental issues is an ongoing process—as we progress toward positive change, we encounter new challenges and more information.

No matter what subject area your workshop participant teaches, there's a good chance that he or she can relate it to environmental issues. If some teachers want help connecting their subject areas to environmental issues, this may be accomplished in an extended break or through small-group interaction as teachers develop ideas for their classroom.

Of the many ways for teachers to approach environmental issues with their students (see pages 13–17 for several descriptions), all are reflected in the simple, fundamental problem-solving process described in the next section. You may want to introduce your workshop participants to this Five-Step Process for Problem Solving before focusing on specific teaching strategies . This way, they will be able to see how the various strategies fit together and how their efforts contribute to the overall curriculum goals. By following this process, teachers are less likely to be subjected to accusations of bias and indoctrination, because their students will have explored several dimensions and discovered how to make careful decisions. This section of the unit will familiarize you with this process and give you tips on teaching it to others.

Five-Step Process for Problem Solving

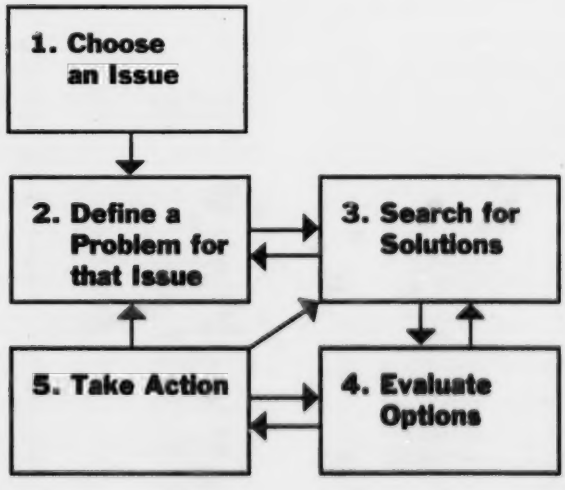
Most complex problems are solved with the same basic steps. Once learners have selected an issue for focus (Step 1), they must define the problem if they are to understand it fully (Step 2). When they have in-depth understanding of the nature of the problem and different viewpoints, they can consider a variety of solutions (Step 3). They need to analyze and evaluate those options (Step 4); this sometimes creates an interplay between creating solutions, evaluating them, and recreating them. The final step, Step 5, is to put that idea into practice—to contribute to some type of actual change.

Environmental problems are different from some others we encounter. In math, for example, all the information is given (Steps 1 and 2) and the problem solver must plug the numbers into a formula (Step 3). Even the "evaluate" step (Step 4) is truncated because the answer is either right or wrong and there is no equivalent to Step 5. But in a complex social or environmental problem, the information may be hard to find or uncertain, the formula may be nonexistent, and several reasonable solutions may present themselves. How does one choose? This five-step process guides the problem-solving process.

Teachers need not start at the beginning of the process and stop at the end. Good programs and solid educational opportunities may involve fewer than five steps or may jump and skip among them. Explain to teachers that they can approach this process from different angles. The following examples illustrate this flexibility.

- Teachers who focus on an issue-investigation process, perhaps through the National Geographic Kids Network, involve students in Step 2, "Define a Problem."
- Teachers who instill hope from analyzing success stories involve students in Step 3, "Search for Solutions," and Step 4, "Evaluate Options."
- Teachers who empower students with an action-taking process involve students in Steps 2–5: "Define," "Search," "Evaluate," and "Act." They could have begun the process by evaluating existing alternatives and then going back to collect more information.

Using the entire five-step process can also be appropriate to current trends in education reform, which emphasize problem solving and critical thinking. This emphasis reflects the growing awareness that students need to be able to assess and manage information to more creatively handle and solve actual problems they will encounter. These skills are built into the five-step model.



We recommend that you use these steps in your workshops, both as an organizing framework and as information that you convey to teachers. The activities in this unit give teachers an opportunity to practice the steps in the process. We have noted related activities at the end of each step. Now, for the five steps . . .

Step 1: Choosing the Issue

The first step in addressing an issue is choosing an appropriate one to investigate. If your inservice is focused on a specific content area (such as groundwater), the field of possibilities will be narrowed. Otherwise, it may be a matter of selecting an interesting, relevant issue. For example, a teacher inservice workshop in southern Maine focused on wetlands issues because a number of the participating schools had been built on wetlands and some of the teachers had already dealt with controversies related to wetlands use.

Teachers may need guidance on how to best choose an issue to investigate with their students. The list below offers some options for them. You may want the participants in your workshop to develop their own list of ideas, or encourage them to make a similar list with their students. You could bring in a two month stack of local newspapers and work in small groups to identify local issues. You could interview a handful of sixth graders to discover what they care about. And you can encourage your workshop participants to do the same with their students.

Generating Ideas to Pursue

- –Identify student concerns.
- –Review local newspaper stories for one month.
- –Brainstorm and rank ideas.
- –Tour the neighborhood.
- –Interview other students.
- –Ask parents or other adults.

Choosing an Issue

- –Vote with two-thirds agreement.
- –Vote with simple majority.
- –Vote with simple majority but record the minority opinion.
- –Allow students to lobby each other, then vote.
- –Reach 100 percent agreement.
- –Use artwork to explore feelings about issues.
- –Examine the issue against established criteria: time, interest, access, complexity, significance, etc.

Issues often present themselves, as well. For example, three students from one elementary class saw a television show on the depletion of the ozone layer. They shared their concerns about ozone with their teacher, and that issue became the focus of a group project. In another case, a teacher who was teaching a class on environmental issues learned about an upcoming state hearing on car emission standards. She offered the topic as a possibility for the class to study. Together, they discussed the reasons for and against choosing that issue and identified what it would take to study the issue in depth before the hearing. The students voted to go ahead, and they ended up making presentations at the hearing. Even though the teacher presented the idea, the decision was left up to the students.

Remind teachers that the process for deciding upon an issue can set the tone for the entire experience. If the teacher selects the issue, students might not be very interested in it unless it is relevant to them or they see why it is important. When students pick the issue, the teacher needs to help them choose one they can take on with some measure of success: one that coincides with their capabilities and resources. In either case, students need to make an investment in their problem. Ultimately, they will realize that they, like the "experts," have valuable insights to contribute to addressing the problem.

Step 2: Defining the Problem

Although the ultimate aim of problem solving is coming up with a solution, the problem-definition phase is extremely important; good solutions require a solid understanding of the problem. Until students have experience, they may have trouble focusing on the problem definition. Instead, they'll want to get to work on a solution. They may find it frustrating not knowing what to do next and being asked to "stay off of solutions" in order to pursue a more systematic analysis. Stress to teachers that this step is necessary and should not be slighted for the more glamorous steps of choosing a solution and taking action.

Teachers will know the problem is well-defined and understood if the students can:

- identify the organizations and groups with an interest in it,

Additional Criteria Teachers May Want to Discuss

- What skills do students need to address the issue?
- Do these skills match curriculum objectives?
- What level of complexity are the students ready for? Can this issue be explored in a way to match this level of complexity?
- Can the issue be adequately addressed in the time we have?
- What is the probability of success if students try to take action?
- How meaningful is the issue to the students?
- What is the teacher's role—information provider, facilitator, adviser? What does the teacher need to play these roles?

- explain how those groups perceive the problem and what assumptions they made about it,
- identify the values and social interests that sustain the groups' involvement in the issue,
- identify their own interests and concerns about the problem or issue, and
- understand the issue well enough to be able to frame it in several ways based on different assumptions and perspectives.[1]

The process of defining the problem will ultimately require gathering information from several resources, clarifying biases, challenging assumptions, and thinking critically about the consequences. Because it involves so many skills and types of activities, this unit includes more information on these skills on page 18 and in the suggested workshop activities on strategies questioning (Activity 5) and survey design (Activity 6).

You won't have time to go through the problem-definition process thoroughly in your workshop, but you can give the teachers practice in defining an issue based on the criteria above. Activity 4 provides one option using a case study. Teachers need to experience some of the things they will be asking of their students—this will stretch their own abilities to define complex issues.

A youth environment group used artwork to identify and choose critical issues to explore. Students drew pictures that somehow conveyed environmental issues they were thinking about and shared them with each other. Then they looked for common concerns in the artwork and used the information to establish the criteria of interest and importance.

Step 3: Searching for Solutions

Searching for solutions involves understanding alternative views and the range of alternative solutions. It requires time to understand the scope of a problem and to experiment with several solutions. It means encouraging great creativity and then going back to the definition stage to learn more about what that solution might entail. This often happens by giving examples and exchanging ideas.

For example, one seventh grade student could only think of two ways to answer the teacher's challenge to write "one million" as many ways as possible. In her mind, you could write it in numbers or letters. A quick peek at her neighbor's page, however, revealed the fraction $^{3,000,000}/_{3}$, and in a flash of insight an infinite number of solutions appeared in her mind.

We often become "stuck" when we can't see other solutions. Examples, analogies, and practice can help build the skills for creative thinking. Teachers may encourage students to move from searching to defining several times as more information leads students to consider new potential solutions. Students may also develop a personal vision of how the issue can be resolved and negotiate a consensus view of the future with classmates. This provides students with an opportunity to imagine what kind of future they would like with regard to this issue, and how they can work toward it. This can also be a powerful way to work at the problem definition.

Searching for solutions can occur at two levels: identifying broad solutions to an issue (such as international agreements to reduce CFC production) and identifying solutions to which the class can contribute (publicizing names of auto shops that reclaim automobile air conditioning fluids). In both cases, students can gather and generate ideas from things they've read, people they've talked with, and their own good thinking.

Workshop activities that demonstrate how teachers might give students new ideas about solutions are "Hosting a Mini-Forum" (Activity 7) and "Using Success Stories" (Activity 8). The latter can be used in conjunction with "The Action Matrix" (Activity 9) to help students analyze the solutions they generate.

Step 4: Evaluating Options

Once students identify a range of solutions, teachers can help them consider the constraints and possibilities of each and the values and interests they serve. Here are some questions you can provide to teachers to direct this process.

- What are the values and interests served by each solution?
- What possible outcomes does each solution hold?
- For each solution, what constraints might stand in the way of the desired outcome?
- Is the solution win-win or win-lose?
- Does the solution directly relate to the problem as the students defined it?
- To which solutions could the class make a meaningful contribution?
- What resources and time would be required?

Remind teachers that, at this point, their role is to support their students in the evaluation process. One method is to provide a structure for evaluating the options. For instance, the teacher's questions can guide written work, small group discussions, and oral reports. Another form of support is encouragement. Remind teachers that answering these questions can be hard work—even many adults have not learned how to evaluate solutions well. Imagery through examples is also helpful. Finally, teachers should give students adequate time and explain that it takes practice to learn to evaluate solutions.

In your workshop, we recommend that you take time to enter and discuss this process with participants. You can use the questions above to analyze several solutions that your participants brainstorm to a local problem, or you can use Activity 4. Again, teachers should experience what their students will do so that they can better understand how to support them in the process.

Step 5: Taking Action

Taking action has to do with understanding what types of changes are possible to resolve the problem, how one can contribute to these changes, and, if appropriate, doing so. The five steps each involve different skills. For instance, the problem-definition step requires critical reflection and analysis; identifying and evaluating solutions involves looking at possible outcomes; taking action involves students in bringing certain possibilities to life.

Teachers and students can be involved in the action-taking step in personal, educational, or political ways. You can increase teachers' understanding of the breadth of possibilities by using these examples to give them some imagery.

Students can share what they learned with others. In an Ohio school, students prepared presentations for the students and teachers in their building. In a Tennessee school, students created lessons to teach younger students about issues. In Maine, students designed a rainforest museum, taking members of the public through it to educate them about rainforest issues.

Students can make personal commitments to contribute to a solution. In one class, the teacher and all the students each made personal pledges to change one aspect of their lifestyles for the environment and shared their pledges with each other. It can be tricky to choose changes that students can make; it may not be appropriate for students to commit their parents to making changes!

Students can help other organizations work toward environmental change by raising money, distributing flyers, putting up posters, or surveying the community. The League of Women Voters, citizen action groups (for example, one of the Public Interest Research Groups), nature centers, Audubon Society chapters, or extension offices may have good ideas for projects in your area.

Students can conduct direct action projects in their school or community with assistance from teachers. There is a diverse and growing list of success stories (see "Resources") from all parts of the country. Students have monitored the quality of the water in local waterways, set up school recycling and composting programs, testified at state hearings, made recommendations to town councils and school committees, petitioned for new town ordinances, and set up hazardous waste collection centers. These projects are only possible after students have worked through all four previous steps of the problem-solving process.

The following guidelines are especially useful for teachers involved in community-based action projects. You may want to reproduce them as a handout, post them on the wall, or ask teachers to develop their own list of guidelines.

- Allow students to "own" the process as much as possible. Ask them what they need and how you can help. Make statements like "Have you considered . . ." rather than just issuing directions.
- As much as possible, let students facilitate meetings and decisions. Use the action project as an opportunity for them to learn and practice key organizing skills.
- Encourage students to consider who might disagree with them, and ask these people to speak to them. Listen to their concerns and consider them while solutions are being evaluated.
- Introduce students to new resources. Ask them if they would like a teacher's assistance in retrieving those resources.
- Realize that students are not always realistic about time. When they identify a project, help them think through the tasks and responsibilities involved.
- Remember that the process is as important as the product. Students with a narrow view of success may have quite a few disappointments in store. If you give them time to work through differences of opinion, the groups' efforts will be stronger.

What if the personal, educational, or direct-action approaches don't seem appropriate for a particular group? The teacher can still use other strategies: providing imagery about how students could take action, sharing information about adult and youth groups that have taken action to effect change, or having the class offer support to established groups working to effect change.

The best way to support teachers in the action step is to help them identify a number of methods for addressing solutions in the classroom. The "Action Matrix," Activity 9, is one way to provide this imagery: it gives students stories and a structure within which to discuss them. Merely handing them out isn't enough.

However teachers choose to accomplish it, the action step is a powerful way to move students' feelings about critical environmental issues from hopelessness or despair to hope and possibility. Young people can be influenced by simply knowing there are adults and other youth working to solve problems and create positive change. Teachers have a responsibility not to leave young people in despair about their future. The action step also lends itself to the ultimate goal of EE: learning how to participate in resolving environmental issues.

Remind teachers to consider who should make the decision about what type of action to take. There are times when it is appropriate for teachers to start with a particular outcome in mind. In many cases, however, students feel more invested when they can participate in selecting the action. The suggestions made for selecting an issue to study (page 8) can be applied to selecting an action to take.

Suggestions for Presenting the Five-Step Process

The Five-Step Process is useful to teachers because it outlines the complete problem-solving process and can help them envision what part or parts of it they would like to use. Such an introduction is possible whether you are offering a short or long workshop. If you have the luxury of a one- or two-day workshop, we highly encourage activities that illustrate the steps.

You might feel as though some of the activities are contrived because your group won't have the time actually required to complete each step, but don't worry. When these activities have been used in workshops, teachers have said they appreciated getting a sense of the entire process. They commented that it was important to "be a student" and see what parts were difficult and in what ways. By doing so, they could anticipate how to support their students when difficulty arose. Some teachers found that by walking through the entire process, they found themselves becoming more willing to work on steps with which they were not initially comfortable. It could be worthwhile mentioning these points to teachers before you begin.

It is also useful to remind teachers that their rationales for being involved with issues can often direct them to a strategy for teaching about issues. And some strategies will not use all five steps in the problem-solving process. For example, if a teacher wants students to understand the issue but not develop action-taking skills, an issue-investigation strategy developed around Step 2 may be more appropriate. If teachers are drawn to the idea of providing hope, you might suggest using case studies of successful strategies for solving environmental problems. And if teachers have committed the time and energy to empowering students by working on solutions, you will want to direct them to action-taking and skill-building programs. The next section discusses ways to introduce these options in a workshop. What is important to note here is that there are a variety of ways teachers can approach issues.

Classroom Approaches To Environmental Issues

III

As we mentioned in the previous section, there are a variety of effective ways to approach environmental and controversial issues in the classroom. Dealing with environmental issues in a classroom setting doesn't necessarily result in students taking flamboyant citizen action or picketing city hall. In fact, time constraints, lack of resources, and the institutional climate may make such efforts very difficult for many teachers. Some evidence suggests that analyzing stories and case studies, conducting interviews, and debating issues and solutions can be as effective at building students' broad understanding of issues and possible solutions as having the class take on a full-scale action project.[2]

Your overview of the Five-Step Process may include many variations that will help teachers realize the diverse ways to incorporate environmental issues into the classroom. This section provides greater detail on three styles of teaching about issues: "Exploring Issues," "Understanding Solutions," and "Making it Happen." Although teachers could employ any of these teaching approaches and utilize all five steps in the problem-solving process, each approach tends to emphasize one or two phases of the process. Each is explained below in the context of these five steps and the activities in the back of this unit.

Although they are distinguished from one another, the various approaches often overlap and can reinforce one another. Choosing among these approaches is a decision that teachers must make for themselves based upon the needs of the students, educational goals, the institutional climate, and teacher experience and confidence. Many of the activities included here give teachers a taste of these different teaching approaches and an opportunity to discuss whether these techniques will work in their situations. In addition, many of the stories in *Getting Started: A Classroom Guide to Bringing Environmental Education Into Your Classroom* illustrate how teachers engage their students in one of these approaches; these might make good examples for your workshop.

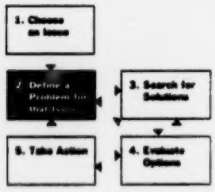
One Fish, Two Fish . . .?

During one investigation project, students in a humanities class were studying the heritage of fishing on the New England coast. Interviews with local fishers uncovered a complex problem related to their way of life, livelihoods, and resource management: overfishing. The class focused on understanding all aspects of this problem by gathering information from local newspapers and both environmental and fishing groups, visiting fish markets, and interviewing many people on all sides of the issue.

1. Exploring Issues

The focus of this approach is defining the issue or problem. Students may or may not choose the issue, but they will identify the concerned parties and the multiple perspectives from which those parties view the problem. Gathering resources, studying, discussing, debating, and role playing are the activities most commonly used to increase students' understanding of an issue. Resources can include textbooks, but more commonly helpful are sources that students may consider "real," such as articles from periodicals and newspapers, media, and local citizens.

Activity 4 might be useful to teachers who select the issue-exploration approach. There are also a number of other resources and techniques. Some of them continue the Five-Step Process by engaging students in activities that practice searching or evaluation skills. You might want to introduce teachers to these materials and ideas in your workshop. Following are several resources to demonstrate or make available to teachers.



1A. National Geographic Kids Network

This computer- and telecommunications-based science program is for fourth through sixth graders. Students investigate new ideas and exchange information with students around the world. There are six units on basic issues: acid rain, weather, water, trash, food, and energy. Teachers register to be involved during a certain period of the school year, when they will be able to interact with students at other locations. Students collect data, then analyze and communicate their findings to others around the world. (See "Resources" for details.)

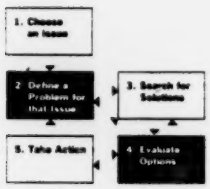
1B. Opposing Viewpoints—A Technique for Understanding Issues

A number of texts encourage debate by focusing on pairs of dissenting voices in the popular media. Accompanying teacher guides offer activities, discussion questions, and test items. Educators can find their own opposing viewpoint articles for discussion of other topics or ask students to do the same. One disadvantage to this approach is that it tends to frame issues in terms of two seemingly intractable "sides" when, in reality, few issues are so simple. Often, the impulse is to reconcile the two sides, which may yield limited answers.

Educators may want to go beyond the debate format to explore the authors' underlying assumptions. The "Heated Controversy" activity (in the "Integrating Environmental Education Into the School Curriculum" unit of the *Workshop Resource Manual*) provides a sample of the types of questions you might explore with teachers who have two different written opinions about an issue (in this case, global warming). *Taking Sides*, described in "Resources" is a source of conflicting views for secondary students.

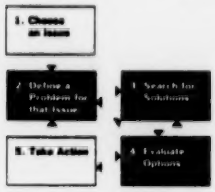
Logs and Jobs

A student at an Oregon high school brought in a newspaper photograph of college students holding signs and demonstrating at the waterfront. A half-mile pile of logs awaiting shipment to Asia was in the background. The student's interest in the photograph initiated a class investigation of the issue. The students researched the origin of logs, the reasons why they were being shipped to Asia, the concerns of the activists, and the practices of the Oregon lumber industry. After talking to members from all involved parties, they considered possible solutions and wrote reports outlining those solutions. The students took responsibility for doing the research but received class time, support, and suggestions from their teacher.



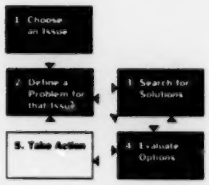
1C. Investigating and Evaluating Environmental Issues and Actions

This widely-known resource in EE³ includes six modules on issue-investigation skills and techniques. Developed by Harold Hungerford and his colleagues, it identifies skills needed for environmental literacy and systematically leads students through an investigation process in which they practice them. Although it builds an understanding of action-taking, this program's primary emphasis is on developing research and issue-analysis skills. Activity 6. demonstrates how teachers can review questionnaire construction and data analysis with students.



1D. Student Investigation Projects

This approach can use the same activities explained in *Investigating and Evaluating Environmental Issues and Actions*, with students choosing their own issues to explore and understand and then considering potential action strategies (see "Resources").



2. Understanding Solutions

This approach to teaching about issues emphasizes the skills that are used during the Search and Evaluation steps of problem solving. Although it is difficult to isolate these steps from the rest of the procedure, there are two teaching techniques that help teachers focus on these skills with their students. One uses the power of narrative, in the form of stories or case studies, to create imagery about solutions; the other uses the Issues Forum process to help students discuss and evaluate several solutions.

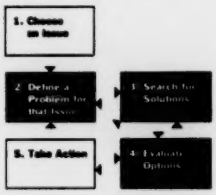
2A. Using Success Stories

Few of us would argue about the power of stories to build our understanding of places we'll never see, like Narnia or the Starship Enterprise. Similarly, true stories are central to how we come to understand our own world. A thoughtful, concerted effort to bring environmental issues into the classroom can use case studies, newspaper articles, first-hand accounts, and literature. It can expose students not only to the issues themselves but to different ways of approaching them, people and organizations that make solutions happen, and the complications they overcome as they do so.

Success stories are one way of giving students positive images of environmental problem solvers. Unlike other environmental awareness techniques, this one is not likely to overwhelm students with the complexity and vastness of doomsday predictions. The stories offer positive imagery that engenders an optimistic yet realistic belief: that typical citizens can indeed make things better. As used here, success stories can run the gamut from the folk tale or myth to a local newspaper article. These glimmers of possibilities are examples of perseverance, concern, and commitment; they provide hopeful images that are often absent in students' lives.

It is not just the huge projects that are appropriate as success imagery but also the third grade class that collected pennies to purchase and protect an acre of rainforest, the urban neighborhood that began monitoring the water quality of its rivers, or the small town in Wisconsin that decided to convert its downtown area to use solar energy.

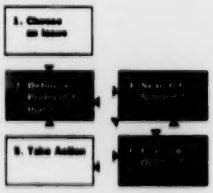
Success stories can be found in the newspaper, magazines, textbooks, TV shows, and even some catalogues! They show up everywhere once one starts to look. Some of the best stories come from other educators. To the extent that you can support informal networks of teachers or make stories available to teachers, you will have offered a service. Activities 8 and 9 help demonstrate how stories can be used in the classroom and then analyzed and evaluated.



2B. National and Environmental Issues Forums (NIF and EIF)

Designed to encourage a "shared" examination of issues, the National Issues Forums and Environmental Issues Forums allow people to talk about aspects of an issue and its solutions that concern them. Issue books provide background on specific issues and lay out possible approaches to solving them. After the advantages and disadvantages of solutions are discussed, the structure of the choices makes it possible for participants to understand the values that underlie the preferences.

Primarily intended for community groups, the NIF and EIF process also functions well in the secondary classroom. Materials and training on how to run a forum or study group are also available, with the NIF emphasizing social issues such as drugs, crime, international aid, and energy use; and EIF building a series of environmental issues, including solid waste, wetlands, and biodiversity (see "Resources"). Activity 7, provides some suggestions for introducing this technique in your workshop.



3. Making It Happen

One of the basic premises of EE hinges on the importance of people—students and citizens—who are involved with and contributing to issues and decisions that have an impact on their lives. All of these teaching techniques contribute to this premise. Students, however, might want to take that ultimate step: taking action to make their proposal a reality. When students enter Step Five of the problem-solving process and work to take action to help resolve the problem, they often find that their initial idea is not perfect. They need to reassess the solution, collect additional information, or understand a different aspect of the problem. Thus, more than the other types of teaching approaches, these examples involve cycling back to the previous three steps in the problem-solving process and trying it again.

The description of action-taking as part of Step Five (page 10) should make a useful reference for teaching approaches in this category. The following resources involve students in and out of the classroom on community-based projects, with an explicit focus on trying to effect change. The NAAEE monograph on environmental problem solving[4] describes the ways practitioners teach problem-solving and action-taking skills as well as the models proposed by educators (notably Hungerford's *Investigating and Evaluating Issues and Action*, Stapp's *Action Research and Community Problem Solving*, and the views of two other prominent environmental educators, Bill Hammond and Ian Robottom).

Examples of how teachers have helped students take action can be found in *Getting Started: A Guide for Bringing Environmental Education Into Your Classroom* and *Involving Your Students in Environmental Action Projects: An Educator's Guide*, a new guidebook produced by Project WILD. (See Resource Section.)

3A. Action Taking: The Student Perspective

Barbara Lewis' *The Kid's Guide to Social Action* is full of activities, worksheets, stories and descriptive how-to's for kids (and teachers) wanting to change something in their communities. It includes guidelines for conducting telephone interviews, attracting media attention, even writing grant proposals. A number of the examples have an environmental focus, which helps learners address community issues they can witness first-hand.

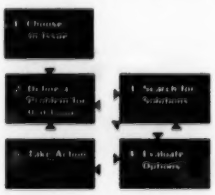
3B. Action Research and Community Problem-Solving

This approach to environmental issues incorporates some of the theory of action research and the practical knowledge of community problem solving. It has been developed and applied internationally by William Stapp. His educational framework underpins the efforts of the Global Rivers Environmental Education Network (GREEN), which links water-monitoring programs all over the world.

The action research theory emphasizes the empowering role of the learner as action taker and the necessity of spiraling back to an evaluation and search phase. Teachers may find the counterpart to the students' investigation an interesting twist: their exploration of their own teaching style and interaction with students. A manual written by Stapp and his students helps to explain this process.

3C. The Monday Group

Bill Hammond, in Fort Myers, Florida, has developed a process, with rules and procedures, for teaching environmental problem-solving skills. This process involves high school students in a course that meets two days a month. Students choose an issue to explore, collect information, design an action plan, and practice the skills they need to carry out the action successfully (whether that be interviewing elected officials or lobbying them); they continue to work on the issue until success is achieved. Descriptions of this process are available in Project WILD's Activity Guide, *Environmental Problem Solving*, and other resources.



IV

Skills for Students and Teachers

NO MATTER WHAT APPROACH a teacher decides to take with environmental issues, there are key skills that students need to develop in order to gain a thorough understanding of an issue. These skills become even more necessary if a class is engaged in active problem solving or action-taking. This section outlines those skills. It also outlines the characteristics of effective *teachers* of environmental issues. If your workshop participants have completed their skill assessment (Activity 2), they may guide you to the types of skills they would like to practice and develop. This description may help you communicate to them the ideal skills. Some of the resources listed at the end of this unit are excellent sources for developing these skills.

Students will apply many skills to any undertaking with environmental issues: resource gathering skills, organizational skills, writing skills. Teachers regularly emphasize these skills. However, several other skills are often left out of the curriculum. To be thoughtfully involved in environmental issues, everyone in the classroom needs to be able to make decisions, facilitate group work, think critically, and manage conflict.

Decision Making Skills

Whether selecting an issue to study, a project to undertake, or an action step to initiate, decision making is used. There are many ways to make group decisions: majority rule, two-thirds majority, consensus, computer selection, secret ballot, options pulled out of a hat, etc. Different decision-making techniques suit different situations, and students need to learn how to discern which would be best.

For example, one class needed to decide who would get to do a particular interview. After identifying the criteria for selecting two students to perform the interview, any students who wanted to could "run." Because many students were running, the students chose majority rule as the decision-making technique, with a secret ballot so no one's feelings would be hurt. The class asked the teacher to count the votes, announce who won, and not indicate how many votes each student received. In another situation, the same class selected consensus as a decision-making technique. Their project involved donating a sizable amount of money to any non-profit organization dedicated to rainforest issues. The students felt it was such an important decision that they wanted everybody to feel good about it, thus—the consensus model.

Stress to your workshop participants that students won't get better at decision making without practice. It is a skill improved through experience.

It's also worthwhile to remind people of the multitudinous ways in which decisions can be made. You could create a quick, fun, and illustrative example of different decision-making techniques in your workshop. How about asking the teachers how long they would like to have for lunch and how they would like to decide? Generate a long list of ways to make the decision and let them try two or three of them. (The list on page 8 includes several.)

Facilitation Skills

Calling a group together, seating people in an arrangement conducive to hearing, making sure everybody who has something to contribute gets that opportunity, keeping the group focused, guiding the group through decision-making steps—these are all facilitation skills. Even upper-elementary students can learn to facilitate discussions and group meetings. Allowing students to practice these skills not only prepares them for adult life, but also gives them more ownership of the learning process. Students learn facilitation skills from good modeling by the teacher and from opportunities to practice.

You might recommend that a teacher let students know that they will eventually facilitate group meetings and therefore should observe the teacher carefully, because the teacher will be modeling the skills. After a week or so, teachers should choose a few students who are likely to do a good job.

As the year or project goes on, allow other students to facilitate, but always let them know that teachers are there to help if they feel they need it.

As a workshop leader, you may want to point out the moments when you are making decisions as a facilitator so they can begin to recognize the process. (Teachers can also follow this process with their students.) Tell participants why you have the room set up the way you do. Note when you are reiterating what a person said or synthesizing a few ideas. Let them know when you are making a decision about how long a discussion should last. Some workshop leaders identify a special place in the room where they will stand when they are making comments about process or facilitation (under the light, beside the sink, in the square delineated by masking tape on the floor). Facilitation happens in a thousand little ways; share them. Another unit in the *Workshop Resource Manual*, "Developing Effective Workshops," includes a section on facilitation skills and how workshop leaders might practice them.

Critical Thinking Skills

In the process of analyzing and defining environmental issues, students are going to encounter differing opinions and conflicting information. Environmental issues are complex; even adults have a difficult time knowing how to respond. One good place for students to begin is by learning to identify what is an accepted fact and what is a personal opinion—practicing with articles they read is one method. As they expand their information searches, they can differentiate between fact and opinion in films, visual materials, and information gathered in interviews. If you are covering this skill in your workshop, you could provide an article that has a healthy mix of fact and opinion and give teachers an opportunity to practice.

Students are also bound to come across materials produced by groups that have a stake in the issue being studied. For example, a fast food restaurant might have a video or kit describing its recycling program. Such materials are often polished and convincing, so you should help teachers critically reflect on them. Here are a few questions teachers can use to guide students:

- "How did this material make me feel? What about it contributed to this feeling?"
- "What facts were provided?"
- "Are these in keeping with other information I have gathered from other sources? If not, how do I know which is accurate? How could I find out?"
- "Did the materials make assumptions? If so, are those assumptions accurate?"
- "What is the purpose of this video or material? What do the producers want me to believe? What do I believe?"

If you can find a good example of propaganda to share with the teachers in your workshop, you could discuss the above questions as a group.

Guidelines for Resolving Conflicts[5]

- Define the problem. State the facts in as calm a manner as possible. Refer to the present situation, not the past or future.
- Say how you feel. Talk about how you are feeling and how the problem has affected you, without making remarks about the other person.
- Explain what you want to change. Consider who is responsible or in a position to make a change. Figure out what you can do to create the change you want, not just what the other party or parties can do.
- Explore options. Consider solutions that will satisfy all participants. Identify the implications of the solution selected.
- Clarify and repeat exactly what people will do to create change. Be specific. Get agreement.

Conflict Management Skills

Addressing environmental issues usually entails a group effort and requires dealing with the emotional, even contentious concerns people have. In schools that emphasize student communication skills and general conflict management, students may already be somewhat able to work through or prevent heated conflicts regarding environmental issues. If that emphasis is not in place, teachers and students might need to concentrate on conflict management skills for a while. Being able to manage conflict and build on others' ideas are at the center of a well-functioning group. Therefore, communication skills (such as active listening, giving constructive feedback, and knowing how to be an active team member) are critical.

There are numerous conflict-resolution and mediation curricula available to teachers and students; some are described in the "Resources" section at the end of this unit. Although they don't directly address environmental issues, the strategies and techniques they cover are useful. In the box above are some of the basics that you could demonstrate, role play, or help teachers practice in a workshop.

Many of the conflicts that will arise in classrooms will relate to strong differences in opinion about an issue. Particularly in situations where family livelihoods are based on resource use, conflicts can become emotional and heated. Teachers can contribute greatly to setting a respectful tone in the class. They can remind students that differences in opinion on the issue are to be expected—that such differences are a part of life and that their challenge will be to learn to handle those differences in a respectful manner. Too often, conflict is seen as a problem that should be avoided, when in actuality it is a normal part of life. What counts is how conflicts are managed. Teachers can actively create a classroom setting in which differences of opinion can become opportunities for learning.

Characteristics of Effective Teachers of Environmental Issues

In general . . .

- Be sensitive to students' needs. Listen to their concerns with your complete attention. Respect their feelings and, particularly with young people, err on the side of caution regarding their emotions.
- Consider your learners' developmental needs.
- Create a learning process in which students feel a sense of investment, ownership, and empowerment. Consider how you can give some of your authority to students.
- Have a support system of people such as an administrator, a colleague, interested parents, or community members.
- Be enthusiastic yourself about the learning process, the project the students are doing, and life in general! It's catching.

As you develop an issues approach...

- Have well-articulated goals and rationales. Encourage parents and others to voice their questions and concerns.
- Share what you know about the issue but also acknowledge what you don't know. Solicit a class effort to look for answers.
- Teach complexity; don't protect students from it. Recognize the difficulty of such complexity, even for adults.
- Teach multiple perspectives. Explore several views on every issue. Use disagreement to spur further clarification and research. Be as even-handed as possible.
- Know yourself. Be aware of your own feelings and opinions about an issue. Be clear about whether concerns are your students' or your own. If you decide to express your opinions on an issue, make it clear to your learners that this is your personal view and that it is okay if other people disagree (even some of your students).
- Allow disagreement to be constructive rather than destructive. Let it further the learning process.

Characteristics of Effective Teachers of Environmental Issues

The teachers in your workshops will also use many of the skills just described. They will be responsible for facilitating a thoughtful and enlightening process for addressing environmental issues. Participants in past workshops have generated the following guidelines for teachers of environmental issues. You might post the guidelines above on newsprint, distribute them as a handout, or ask participants to critique them or generate their own.

V

Common Barriers and How to Circumvent Them

THERE ARE NUMEROUS BARRIERS that teachers face, or think they will face, when bringing environmental issues into their curricula and classrooms. Although barriers will vary from individual to individual, some are more common than others. Teachers attending a workshop on addressing environmental issues identified the following barriers and ways to resolve them.

Structural Barriers

"The school year isn't long enough to cover the text* and *address issues."
Teachers can use the text to suggest topics and expand from there. It is true that in-depth research and action projects are time-consuming endeavors. However, teachers find that engaging in such projects reinforces skills and information they were covering in their texts. In addition, issues can be addressed through less time-consuming approaches such as reading and studying a problem or exploring success stories.

"My class periods are too short and there's no time to plan."
Teachers have three alternatives: covering issues in small steps over several months; asking students to explore an issue after school (their motivation may be greater if they have chosen the issue); and, most difficult but potentially most valuable, restructuring the school day through team teaching or occasional double periods.

"I don't have relevant materials for teaching about issues."
The resource list in this unit is a start; there are also local materials from many environmental organizations and natural resource agencies. Some of the most interesting lessons pair opposing, one-sided publications from, for example, industry and Greenpeace. (To learn about some effective but less traditional educational resources, see "Using Community Resources," another unit in the *Workshop Resource Manual.*)

Personal Concerns as Barriers

"I don't know enough."
You can provide background resources, workshops, and experiences to increase teachers' confidence. You might also concentrate on helping them feel more comfortable when they don't know the answers; they will be exploring with their students and simply facilitating the process of learning.

"Parents and community members might not approve."
Teachers need administrative support to face community disapproval. School district goals of teaching responsible citizenship are often useful rationales for exploring issues. Beyond that, teachers need to pay careful attention to the controversy and provide equal treatment for all sides. You can stress this point by emphasizing the Five-Step Process.

"This is a new way of teaching for me."
Teaching environmental issues well may stretch teachers to teach in ways they haven't and, particularly with action projects, may require that they evaluate their roles and adapt them to be more learner-centered. This can be uncomfortable and threatening. This kind of change requires more than just information about how to do it—it requires peer support and feedback to build needed skills and confidence. Offer follow-up support for a workshop on issues! (See "Designing Effective Workshops" in the *Workshop Resource Manual.*)

Support Barriers

"My principal doesn't support this type of education."
It may not be advisable to encourage teachers to go against their administration, even if their rationale is solidly grounded in the school district objectives. You might consider offering a workshop for administrators, inviting teachers to bring their administrator, or bringing some illustrious speakers on education reform to your region. You might even mount a campaign with letters to the local newspaper decrying the state of local education, in which students can't learn about environmental issues.

"My colleagues aren't supportive."
Make sure that the participants in your workshop leave with each others' names and addresses. They may become each others' best support group.

As a facilitator, you won't be able to find solutions to each participant's barriers. However, you can provide them with "the gift of time" to identify, analyze, and develop strategies for overcoming the barriers they will face as individuals. Without taking time to do this, the barriers may quickly stand in the way of good ideas coming to fruition, even for enthusiastic and willing teachers. Activity 3 offers a process for helping teachers identify their barriers and generate solutions to overcome them.

VI

Workshop Activities and Masters: Approaching Issues

THESE WORKSHOP ACTIVITIES offer starting points for facilitators who want to empower teachers to introduce, discuss, and act on issues with their students. We don't know what issues will be appropriate to your audience, so the activities offered here deal with skills and approaches rather than action. You will need to help teachers find resources and information on specific issues in other places (see, for example, the "Resources" section here, and two other *Workshop Resource Manual* units: "Integrating Environmental Education Into the Curriculum" and "Using Community Resources").

The first three activities focus on the value of dealing with issues and help teachers anticipate what they will need to incorporate issues into their teaching. Related activities are offered in other units of the *Workshop Resource Manual*: "Defining Environmental Education" and "Integrating Environmental Education Into the School Curriculum."

1 Building A Rationale

The importance of issues in the classroom—how would you explain this to a visitor from the South Pacific?

2 What Skills Do I Need?

An examination of what students and teachers need to effectively engage issues and solve problems. Useful as a needs assessment for the participants and the facilitator. Includes Master 1 (a handout on skills) and Master 2 (a needs assessment).

3 Overcoming Barriers

Considers the real and perceived obstacles to dealing with issues in the classroom, and guides teachers in generating ideas for overcoming them.

These three activities focus on specific skills teachers will need as facilitators of students investigating issues.

4 Evaluating a Case Study: the Problem of Finding Solutions

Small groups analyze a case study, weigh different perspectives (including their own!) in defining an environmental problem and devising options for a solution. Master 3 is an overhead of the 5-Step Process; Master 4 provides questions about defining issues; Master 5 is a matrix for evaluating solutions.

5 Strategic Questioning

A large or small group exercise introducing a scheme for addressing the feelings and ideas that can be focused on solving environmental problems. Master 6 describes strategic questioning families.

6 Survey Design and Analysis

Small groups practice using surveys, and discuss ways of improving questions to elicit better information. Includes Master 7, which is a sample survey, and Master 8, a tallying tool.

The final three activities that will help you show teachers what they could do in their classrooms if they choose one of the three approaches to addressing issues (see pages 13–17). These demonstrate techniques for involving students in their own investigations and are particularly useful in longer workships or in workshops focused on a specific environmental activity.

7 Hosting a Mini-Forum

An interactive exploration of an issue from multiple perspectives and a process for understanding them.

8 Using Success Stories

An activity that offers several engaging examples of success stories, and helps teachers develop criteria for what makes an interesting story. Includes sample stories on Masters 9, 10, and 11 and discussion questions on Master 12.

9 The Action Matrix: a Tool for Analyzing Issues

A systematic approach to discovering the range of possible solutions to environmental problems. Instructions for teachers are provided on Master 13 and a blank Matrix is provided in Master 14.

Activity 1

Building A Rationale

An icebreaker, where participants explain why they believe students should deal with environmental issues.

Objectives

To get to know other members of the group; to build a collective sense of purpose in exploring issues.

Materials

Blackboard and chalk or newsprint and markers.

Time **30 minutes**

Outline

1

Set the stage for a mini-simulation. Ask the group to pretend their school is hosting an international guest for a few days, as a part of a community-wide global education program. This particular guest, Mr. Eti, is from Western Samoa, a country with a strong traditional approach to village life. During his presentation, Mr. Eti asserts that his school system does very well by teaching youngsters to memorize information learned from textbooks. By testing this knowledge, the schools can identify those students who will best survive university life in Australia or New Zealand. The speaker has a difficult time responding to audience questions about how children learn about current issues or problem-solving skills—why do these things need to be taught? Furthermore, these are concerns with which the village elders—not young people wrestle. (Participants are likely to have heard similar proclamations from teachers in this country!)

2

Ask the participants to imagine that during the reception afterward, they have an opportunity to explain to Mr. Eti why American teachers try to bring current issues into the classroom.

Option 1

Keep participants in a large group. Ask them to think for a moment about what they would say to the Samoan educator, and then make a list on newsprint of their answers.

Option 2

Divide participants into small groups. Give each group 15 minutes to generate aresponse to the guest; then briefly outline their responses for the entire group.

3

In a group discussion, pull together their responses and point out reasons that weren't mentioned (see pages 3–4 on rationale for teaching issues).

Activity ❷ What Skills Do I Need?

A survey and activity to (1) explain the key skills needed to address environmental problems and (2) assess participants' familiarity with those skills.

Objectives

To assess skills needed to teach students about environmental issues; to assess own needs; and to plan future workshops.

Materials

Handouts from Masters 1 and 2.

Time **45 minutes**

Outline

1

Explain that using environmental issues to teach students involves a range of skills, including facilitation skills, that teachers themselves need, plus problem-solving and communication skills that teachers will want to develop in their students. Although teachers understand and apply many of these skills, they may not have had the opportunity to focus on where they have strengths and weaknesses as they approach issues in the classroom. (See pages 18–21 for additional descriptions of these skills.)

2

Distribute handouts from Master 1 and ask participants to work in small groups to discuss these questions:

- Do you address these skills in your classroom?
- Do you teach these skills to students?
- What criteria might you use to decide if you are successful in using or teaching these skills?

3

Lead a group discussion about the criteria that each group came up with and use these questions if appropriate:

- Which are skills teachers use every day?
- Which are areas in which teachers have questions?
- Which skills might teachers want more guidance, practice, and experience?

4

Distribute handouts from Master 2 and ask each participant to complete the form. (You may wish to adapt the needs assessment form to address the types of skill-building workshops and activities you can offer or other skills that you think might be needed by teachers in your area.)

5

Collect the forms. If this is a multiple-session workshop, consider summarizing the results to present to participants later. Otherwise, conclude with a brief discussion about what participants felt were their greatest needs, and generate ideas for how those needs might be met.

Master 1

Skills for Addressing Environmental Issues

When teachers and students are asked to explain environmental issues, they often think in terms of knowledge—facts about why global climate is (or isn't) changing; economic arguments for recycling; statistics that tie hazardous waste to cancer. But solutions to environmental problems depend even more critically on skills. Key skills needed by environmental problem solvers could be grouped into four general categories.

Thinking Skills are used in three ways:

- To generate ideas. This creative component includes coming up with new ideas, expanding possibilities, stretching the imagination.
- To clarify ideas. This analytic component enables teachers and learners to detect bias, identify assumptions, and in general, pull apart ideas to understand the pieces.
- To evaluate ideas. This is a critical thinking component. It involves assessing the reliability of one's information and inferring the consequences of alternative ideas.

Problem Solving Skills follow a series of steps:

- Defining the problem. A critical phase of good problem solving. Developing a shared definition of the problem is an essential first step. This involves analyzing the issue and identifying the needs and concerns of all involved. In addition to clearly stating the problem, it is important to agree on what criteria have to be met before the problem is considered "solved."
- Generating alternative solutions. A productive thinking phase, which involves coming up with a range of possible solutions and expanding on them.
- Evaluating and choosing a solution. An assessment and decision-making phase, which guides participants toward selecting an option that meets the stated criteria and goals.
- Implementing a solution and evaluating success. The "action-taking" phase, in which those involved implement and then monitor their chosen approach. The problem-solving effort may lead participants to discover complications, and a need to rethink the problem and explore other options.

Group Process Skills include:

- Effective communication. The ability to write and speak clearly, and to listen actively.
- Teamwork. Building on others' ideas and strengths. Giving constructive and supportive feedback.
- Conflict management. Identifying and resolving friction between group members.

Facilitation Skills help prepare leaders. Responsibilities of a group leader include the following:

- Keeping the discussion flowing smoothly and on target.
- Ensuring participation from all members.
- Helping the group complete tasks and make decisions.

Master 2

Problem-Solving Skills

Needs Assessment

How would you rate yourself on the following?

1=very low ... 3=somewhat .... 5=very high
x=I don't really know!

	My comfort level teaching these:	**My personal ability in:**	**My interest in improving:**
Thinking skills	1 2 3 4 5 x	1 2 3 4 5 x	1 2 3 4 5 x
–Generating ideas	1 2 3 4 5 x	1 2 3 4 5 x	1 2 3 4 5 x
–Clarifying ideas	1 2 3 4 5 x	1 2 3 4 5 x	1 2 3 4 5 x
–Evaluating ideas	1 2 3 4 5 x	1 2 3 4 5 x	1 2 3 4 5 x
Problem-Solving	1 2 3 4 5 x	1 2 3 4 5 x	1 2 3 4 5 x
–Defining the problem	1 2 3 4 5 x	1 2 3 4 5 x	1 2 3 4 5 x
–Generating alternative solutions	1 2 3 4 5 x	1 2 3 4 5 x	1 2 3 4 5 x
–Evaluating solutions	1 2 3 4 5 x	1 2 3 4 5 x	1 2 3 4 5 x
–Choosing a solution	1 2 3 4 5 x	1 2 3 4 5 x	1 2 3 4 5 x
–Implementing a solution	1 2 3 4 5 x	1 2 3 4 5 x	1 2 3 4 5 x
Group Process Skills	1 2 3 4 5 x	1 2 3 4 5 x	1 2 3 4 5 x
–Effective communication	1 2 3 4 5 x	1 2 3 4 5 x	1 2 3 4 5 x
–Giving feedback	1 2 3 4 5 x	1 2 3 4 5 x	1 2 3 4 5 x
–Building on others' ideas	1 2 3 4 5 x	1 2 3 4 5 x	1 2 3 4 5 x
–Conflict management	1 2 3 4 5 x	1 2 3 4 5 x	1 2 3 4 5 x
Facilitation Skills	1 2 3 4 5 x	1 2 3 4 5 x	1 2 3 4 5 x
–Keeping conversation flowing	1 2 3 4 5 x	1 2 3 4 5 x	1 2 3 4 5 x
–Ensuring participation	1 2 3 4 5 x	1 2 3 4 5 x	1 2 3 4 5 x
–Helping group complete task	1 2 3 4 5 x	1 2 3 4 5 x	1 2 3 4 5 x

Activity 3

Overcoming Barriers

Small and large group discussion of the challenges teachers anticipate as they consider addressing issues with their students.

Objectives

To identify barriers to approaching issues in schools; to develop and share solutions to these barriers.

Materials

Newsprint and markers for each group; pencil and paper for each person.

Time 40 minutes

Outline

1

Explain that in this activity, the group will consider the barriers they anticipate as they begin to address environmental issues with their students. It may help to outline a scenario. For example, you might suggest to middle school social studies teachers that they are planning a three-week unit on the impact of a building development. What might keep them from following through on the idea? What might keep them from completing the planned unit once they get started? What concerns do they have?

2

In small groups, ask the teachers to list barriers they imagine arising and rate each barrier in terms of its importance. You might have them organize their lists by using the three categories suggested on pages 22–23: structural barriers, personal concerns, and support barriers. Also ask them to decide which items on their lists are existing barriers, and which are perceived or anticipated barriers. Asking teachers to describe the barriers helps develop greater understanding of them, and sets the stage for considering how to overcome them.

3

Initiate a brief general discussion with questions such as:

- What are the most serious issues?
- Were there any barriers suggested that you found surprising?
- What resources are available for overcoming barriers?
- Are there obvious benefits to addressing issues brought up in your discussions?

You might want to point out that the list of personal concerns includes barriers that they have control over, whereas the others are not. For example, teachers may feel that their lack of background in environmental studies is a significant barrier. They do, however, have control over what they learn. They also have the option to go forward without being experts and enter the process in a learning mode with the students.

4

Ask each group to give its list of barriers to another group. Now everyone is wrestling with someone else's problems! Ask each group to choose three barriers on the list and identify several ways they might be solved. Give them 15 minutes to discuss these solutions, and then ask a representative from each group to present the solutions to the full group. You may offer a few suggestions for overcoming barriers as you listen to each of the groups.

5

Lead a discussion after you've heard from each group. If there are a few barriers that seem particularly difficult to overcome, take some time to brainstorm ideas as a whole group, drawing on the experience of the teachers as well as your own. Many teachers have overcome significant barriers and will have examples to share.

Activity 4

Evaluating a Case Study: the Problem of Finding Solutions

Small groups analyze a case study, weigh different perspectives for defining an environmental problem, and devise options for a solution.

Objectives

To practice identifying all aspects of an issue and evaluating possible solutions; to learn a process to use with students.

Materials

Case study of an environmental issue (perhaps Master 10); handouts and overheads of Masters 3, 4, and 5.

Time

40 minutes for Part One plus 30 minutes for Part Two.

Facilitator Prep

Choose a case study to provide teachers with an environmental issue to analyze. The case study should include information on an environmental problem and some clues about how different members of the community are affected by it. If you choose a local issue, you won't need to provide as much detail, as the teachers will bring their own knowledge into their discussions of the issue.

Part One
Defining the Issue

1

Introduce the 5-Step Process for Exploring Issues (Master 3). In this activity, Step 1 of the 5-Step Process (choosing an issue) will be done in advance— you will provide the issue as a case study. The participants' role will be to define the problems implied by that issue, search for solutions, and evaluate these options for solution (Steps 2–4).

2

Have the teachers form small groups and hand out the case study. When they have finished reading, distribute a handout of Master 4. To complete this handout, give the groups 20 minutes to (1) identify the individuals, businesses, and organizations affected in the problem the case study highlights, and (2) to suggest how these "interested parties" will each experience the problem.

3

Have a representative from each group report its findings. Summarize the information on an overhead chart of Master 4. Lead the group in the following discussion questions:

- Why did different small groups choose different interested parties?
- What was difficult about defining the issue?
- How did group members' own values and biases come into play?
- What should be modified to use this activity with students?

Part Two
Evaluating Options

4

As a large group, brainstorm a list of possible solutions to the issue in the case study. (Provide time to read the case study again, if necessary).

5

In small groups, have each group analyze one of the solutions and fill out the Solution Worksheet (Handout/Overhead Master 5).

6

Have representatives from each group report their ideas to the large group. Fill in the matrix on an overhead of Master 5 as the groups report.

7

As a large group, discuss the solutions and the additional information students would need to determine the "best" solution. Ask participants to rank the solutions and discuss the criteria that are guiding their choices. What values are assumed? Whose interests are judged most important?

8

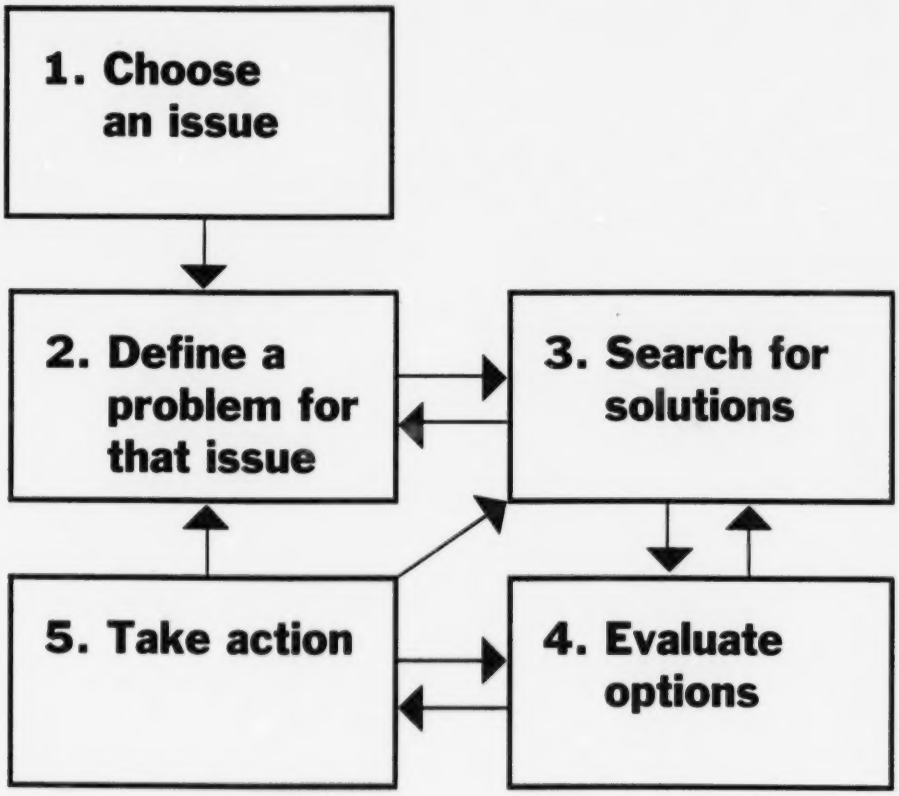
So far, the group has worked toward a decision by weighing values. Making the best decision also depends on understanding the facts of the case. As a large group, discuss the types of information needed to analyze options. What resources are available to obtain this information?

9

Consider strategies for adapting this activity for participant's classrooms. What issues would students find most engaging? How could students collect information that would enable them to evaluate their chosen solutions?

Master 3

A 5-Step Process For Exploring Issues



Defining Issues

Interested Parties	How are they affected?	How do they perceive the issue?	What are their values?	Needs/Desires
Yourself, if this were in your neighborhood or community				

Master 5

Evaluating Solutions

Solution for Analysis:

What values are served?
(fairness, efficiency, productivity, etc.)

Whose needs are met?
(Are there trade-offs? Can one solution work for all?)

What are the positive effects?
(for the interested parties; for the environment)

What are the negative effects?

What groups are needed for implementation?

What are barriers to the solution?
(political/economic/cultural/practical)

Activity 5 Strategic Questioning

A large- or small-group exercise addressing the feelings and questions that can be focused on solving environmental problems.

Objectives

To recognize the importance of feelings, values, and interests when investigating issues; to learn a systematic approach to guiding students in problem exploration.

Materials

Handout from Master 6

Time 20 minutes

Outline

1

Introduce strategic questioning as a systematic approach to helping students explore a problem (see page 8-12). Strategic questioning goes beyond analysis of the facts to probe the feelings, hopes, and fears underpinning the situation. The goal of this activity is to practice choosing from "strategic questioning families" to encourage learners to listen to themselves and others in order to discover the next step in solving the problem.

2

Read this paragraph to the large group (or distribute copies to smaller groups):

Sue and Colin Lennox teach in a middle school in Sydney, Australia. One Monday morning they found their students in an uproar about a chemical spill in the creek behind their school. All the fish in the lagoon (which is fed by the creek) were dying. Sue thought this would be a good opportunity to help the students learn to ask questions about the problem—questions that would help build their understanding about the event and their options.

3

Ask participants to spend 10 minutes in pairs or groups coming up with some of the questions the students might ask if they were given the opportunity to investigate this issue.

4

Hand out copies of Master 6. Which types of questions did the group overlook? Why might they be important to ask?

5

Teachers may appreciate hearing the rest of the story:

The students went out to talk to the neighbors, their fellow students and teachers. They also visited the creek, which helped them realize how sad they felt about the pollution. They knew that they had to do something. They came back from their consultations with many good perceptions and ideas. Eventually, they determined which ideas best fit their own talents and time frame.

Now, for the past two years, the students have been working on testing the water in the creek, finding the source polluting the creek, talking to the members of the local city council and the wider community, and making videotapes. The students have also been teaching other students throughout Australia to do the same.

For more on strategic questioning, see "Strategic Questioning: For Personal and Social Changes," listed in the "Resources" section of this unit (page 58).

Master 6

Strategic Questioning Families

By using the right questions, teachers can guide student discussions through a progression of concepts, helping them to define and explore an environmental problem before making the leap to action taking. The "strategic questioning families" presented here help reveal the ideas, feelings, and values that influence the judgments that people make.

Observation Questions direct attention to what one has seen and heard about a situation.

- What have you heard and read about this situation? Do you trust the source? Why or why not?
- What effects of this situation have you noticed?
- What do you know for sure and what are you not certain about? How can you find out more?

Key Words: see, hear, know, investigate

Feeling Questions are concerned with body sensations, emotions, and health.

- How did you feel about the situation when you first heard about it?
- What do you feel when explaining this situation to someone else?

Key Words: feel, need, tired, angry, sad, frightened, anxious, frustrated

Visioning Questions are concerned with identifying one's ideals, dreams, values.

- How could you change the situation to be as you would like it?
- In this situation, what do you care about most?
- What is the meaning of this situation in your own life?

Key Words: hope, wish, anticipate, like, love

Change Questions are concerned with how to get from the present situation to a more ideal one.

- What will it take to bring the current situation towards the ideal?
- How might those changes come about? Name as many ways as possible.
- Who or what could make positive difference? Have you seen or read about changes made in similar situations?

Key Words: improve, reform, fix, replace, invent.

Personal Inventory and Support Questions are concerned with one's motivation and capacity to contribute, and identifying the support necessary for one to act.

- What aspects of the situation interest you the most?
- What do you like to do that might be useful in bringing about changes?
- What support would you need if you were going to change the situation?

Key Words: experiences, needs, skills.

Personal Action Questions are those which specify what, how, and when to do something. The actual plan begins to emerge.

- Who do you need to talk to?
- How will you get an introduction to them that will establish your credibility?
- How can you get others together to work on this?

The questions can become more subtle and subjective as one deepens one's understanding of the technique. For example, notice the difference between "Why don't you work on poverty?" and "What keeps you from working on poverty?"

Activity 6 Survey Design and Analysis

Small groups practice using surveys and discuss ways of improving questions to elicit better information.

Objectives

To improve skills in using questionnaires that explore environmental issues; to explore techniques for designing effective questions.

Materials

Masters 7 and 8 (Option A); access to a copy machine (Option B)

Time

1 hour (option A) or
4 hours (option B)

An important step in the environmental problem solving process is gathering information (see pages 8 and 14). Sometimes, collecting information is fairly simple, such as counting the number of cars carrying only one person at rush hour. It can be more complicated when the information concerns needed people's opinions. How survey questions are worded and how the responses are recorded make an enormous difference in the quality of information gathered from surveys. This activity gives teachers a little experience with several different types of questions and recording techniques. Here we use a survey on recycling. If your audience has another environmental issue focus, redesign or replace this sample as appropriate.

Option A
Outline for one-hour session

1

Distribute copies of Master 7 and explain to the group that this survey was designed to help determine how successful a recycling campaign would be in a state without a bottle bill. The coordinators of this (fictitious) committee thought they needed to know more about the buying habits of the local shoppers before they could convey the right message about what could and should be recycled. As you distribute the surveys, ask participants to find a partner and interview each other using these survey questions. Small groups of partners should then work together to summarize their answers using Master 8.

2

As a large group, discuss the results. You may find these review questions helpful:

- Which questions did people have difficulty answering?
- Which questions did not provide the information you really wanted to know?
- How might these "problem" questions be improved?
- What other information would you want to know?
- How could you frame the questions to get this information?

3

Summarize by outlining the "rules" the group develops for good survey design.

Survey Design Tips

- In general, questions that require respondents to give percentages and frequencies are difficult to answer. People wonder if they remembered everything or if they are "counting" correctly.
- In general, yes/no questions don't give you very much information: they don't leave room for anyone to respond "sometimes" and could often be altered to ask "how often," "how strongly do you feel," or "how interested are you in..."
- Categories and ranges are reasonable ways to get information.
- Make sure all likely answers are built in to the close-ended questions. Use open-ended questions sparingly.

Option B
Outline for four-hour session

1

Explain that in this activity, participants will design a survey and interview each other about an issue. As a large group, agree on a topic to investigate.

2

With the help of the group, generate a few categories of questions that would make sense to ask. Categories might cover demographic information, knowledge, ability, preference, attitude, habit, willingness, confidence, etc.

3

Assign small groups to generate five survey questions within each category. After 10–15 minutes, collect each group's questions and make copies of the complete survey, but keep each group's questions on a separate page. Distribute copies of the survey and ask participants to pair up and survey each other with their questions.

4

Redistribute the completed forms to each group so everyone has the reslults of the questions they generated. Ask them to tally and interpret the results. As a large group, discuss what they learned about the topic and the art of survey design:

- What does their survey tell them about the topic?
- Which questions gave you the informa tion you wanted; which didn't?
- What changes in question wording would have been helpful?
- As a survey respondent, what questions did you find confusing?
- What additional categories or questions should have been asked?

5

Summarize by outlining the "rules" the group developed for good survey design.

Master 7

Example Survey

Interviewer name _____

Interviewee name _____

Introduce yourself to your interviewee and ask if he or she would answer a few questions about glass and metal containers in his or her household. You are working on a committee to improve recycling in your town.

1. Person responding is: Male ____ Female ____

2. Address: _____

3. How many people in your household share the food you buy? ____

4a. Do you purchase any part of your groceries other than beverages (soft drinks, juice, beer) in metal containers? Yes [ ] No [ ]

4b. Do you purchase any part of your groceries other than beverages (soft drinks, juice, beer) in glass containers? Yes [ ] No [ ]

4c. Do you purchase any part of your groceries other than beverages (soft drinks, juice, beer) in plastic containers? Yes [ ] No [ ]

5a. Do you purchase any beverages in metal containers? Yes [ ] No [ ]

5b. Do you purchase any beverages in glass containers? Yes [ ] No [ ]

5c. Do you purchase any beverages in plastic containers? Yes [ ] No [ ]

6. Of all the beverage containers that you buy, what percentage do you return to the store?
<10% [ ] 10%–40% [ ] 40%–60% [ ] 60%–90% [ ] > 90% [ ]

7a. Of all the non-beverage metal containers you buy, what percentage do you recycle?
<10% [ ] 10%–40% [ ] 40%–60% [ ] 60%–90% [ ] > 90% [ ]

7b. Of all the non-beverage glass containers you buy, what percentage do you recycle?
<10% [ ] 10%–40% [ ] 40%–60% [ ] 60%–90% [ ] > 90% [ ]

7c. Of all the non-beverage plastic containers you buy, what percentage do you recycle?
<10% [ ] 10%–40% [ ] 40%–60% [ ] 60%–90% [ ] > 90% [ ]

8. The next question has a 5 point scale where unwilling = 1 and very willing = 5. How willing would you be to recycle your non-beverage containers if you could....

a. return them to the grocery store? 1 2 3 4 5

b. pay a deposit and get it back at the store? 1 2 3 4 5

c. recycle them in one central location? 1 2 3 4 5

d. put them out with the trash each week? 1 2 3 4 5

e. give them to a Scout group? 1 2 3 4 5

9. Have you ever purchased products made from recycled materials?
Yes [ ] No [ ]

Thank you for your help

Activity and survey adapted from *Investigating and Evaluating Environmental Issues and Actions* by Harold R. Hungerford, Ralph A. Litherland, R. Ben Peyton, John M. Ramsey, Audrey N. Tomera, and Trudi L. Volk. Champaign, IL: Stipes 1985.

Master 8

Responses to the Model Questionnaire

Total number of male respondents ____
Total number of female respondents ____

Households containing 1–3 people ____
Households containing more than 3 people ____

Number of people who purchase:

- groceries in metal containers ____
- groceries in glass containers ____
- groceries in plastic containers ____
- beverages in metal ____
- beverages in glass ____
- beverages in plastic ____

Number of people who return the following percentages of beverage containers:

>90% ____
60–90% ____
40–60% ____
10–40% ____
< 10% ____

Number of people who recycle non-beverage containers made of:

Metal	Glass	Plastic
>90% ____	>90% ____	>90% ____
60–90% ____	60–90% ____	60–90% ____
40–60% ____	40–60% ____	40–60% ____
10–40% ____	10–40% ____	10–40% ____
< 10% ____	< 10% ____	< 10% ____

Average willingness score of respondents for recycling non-beverage containers if they could....

a. return them to the grocery store? ____
b. pay a deposit and get it back at the store? ____
c. recycle them in one central location? ____
d. put them out with the trash each week? ____
e. give them to a Scout group? ____

Number of people who purchased products from recycled materials: ____

Activity 7

Hosting a Mini-Forum

An interactive exploration of an issue from multiple perspectives.

Objectives

To explore how an Environmental Issues Forum can help students understand various perspectives on an issue; to gain experience with a teaching method that removes the teacher from the position of authority and empowers the students.

Materials

EIF issue books (optional), newsprint and markers or chalk and chalkboard

Time **One hour**

Outline

1

Explain that the Environmental Issues Forum Program (see page 16) provides materials on interesting, controversial issues and a procedure for community members to hear and understand how other people feel about the issue. The process helps participants reach a sense of "common ground," a shared vision of which solutions are most acceptable, and a more sympathetic view of the way different people see the problem. The program is managed by the North American Association for Environmental Education (NAAEE). You can receive more information about EIF from the NAAEE offices—see page 59 for details.

2

Provide participants with background on the issue you have chosen. You can use your own source of information, any of the existing issue books (contact NAAEE), or the outline on solid waste issues given here.

3

For a mini-forum on solid waste: Explain that many communities are producing more garbage than they can economically burn, bury, or process. What are their choices? How do their choices affect other communities? Outline three different positions that could be held by various advocates:

Reclaim it

By using new technologies and public participation strategies, we can recycle garbage into raw materials for new products for consumers to buy. The recycling process conserves energy and natural resources while cutting down on the amount of waste that ends up in landfills and drastically reducing pollution.

Reduce it

There must be a fundamental shift in our lifestyles if we are to effectively address the solid waste problem. We don't need half the products on sale today, nor their packages. We can buy in bulk, we can reuse materials, and we can buy things that last longer than the typical throwaway item that characterizes our consumptive society. A more modest and environmentally committed society is the best hope.

Get rid of it

Modern technology has the ability to cope with many of our concerns about solid waste disposal. With new incinerators and safer landfills, we can continue to dispose of our garbage in the same, efficient, convenient manner we always have. Better landfills can be built in rural areas, where communities will welcome the economic benefits.

4

Ask participants to discuss the advantages and disadvantages of each position. Write these on the chalkboard or newsprint in + and - lists under each choice.

5

As you fill in the matrix of opinions, you may need to build some imagery about the types of people who might think otherwise. What would the President of Ford Motor Company say about increased charges for waste disposal? Why would the mother of five youngsters want to use cloth diapers?

6

Facilitate the discussion to probe for underlying value positions and striking similarities or differences between choices. The following questions may be helpful for teasing out opinions:

- What are the consequences of this choice?
- What would the advocates say is the best feature of this choice?
- How would someone make a case against what he or she just said?
- Does this choice affect all members of the community equally?
- What would critics of this choice say?
- You said you favored both choices, but which would you want implemented first?
- What would advocates of this choice care most deeply about?
- What is there about this choice you just cannot live with?
- Could we accept the long term consequences of this choice?

7

Close the Mini-Forum by asking what new thoughts and opinions participants heard and how their initial positions and biases might have changed. Discuss in what grade levels an EIF program might be beneficial and what teachers might do to prepare themselves and the students for a Forum.

Activity 8

Using Success Stories

An activity that offers several engaging examples of success stories.

Objectives

To analyze environmental success stories; to develop criteria for what makes an effective persuasive story.

Materials

Handouts from Masters 9, 10, and 11; overhead from Master 12.

Time **45 minutes**

Outline

1

Arrange participants in three groups, each of which will read and report on one story. Give each group a copy of Master 9, 10, or 11. Ask each group to read its "success story" and prepare a short verbal description for the others. Each report should briefly summarize the story and answer these questions, which you can display as an overhead (Master 12):

- What motivated the individual or group in this story to take action?
- What types of action did they undertake?
- What barriers and challenges did they face?
- How did they overcome these barriers?
- Do you know stories in which people faced a similar challenge?

2

Initiate a discussion by asking volunteers from the large group to describe the elements of these stories that made them interesting to read. They might suggest the following:

- The story is real, with real people and in a real place.
- The story has quotes and numbers—real details.
- You get to know the character and sometimes feel as though it might be you.
- The story describes of the problem and proceeds to solutions following the progression of time.

3

Distribute the other two stories to each participant so they have a complete set to take home. Consider following up this activity with Activity 4 ("Evaluating a Case Study") or Activity 9 ("The Action Matrix"). These activities provide different approaches for analyzing environmental issues and a strategy for discussing solutions.

Master 9

Students Tackle Global Warming

Alexis Gray was just seven years old at the time. She needed help from her fellow students in dragging the heavy, orange mail bags across the floor of the Senate hearing room. "Excuse me," she asked Senator John Chaffee, "Would you take these petitions to the President when you see him this afternoon?"

Chaffee agreed, and Senator Albert Gore (elected Vice President of the United States in 1992) looked on with amazement at the eight bags, each overflowing with folded papers. "How many signatures do you have there?" he asked.

"About 100,000," answered Alexis politely.

One of her fellow students shouted out, "And that's nothing yet! We'll have a million by Earth Day!" The packed Senate hearing room rocked with laughter—and respect.

The stuffed mailbags represented several months of work by about two million American students, most of whom were in the fifth and sixth grades. They belonged to a coalition of 15 student environmental organizations across the country who had joined together to help slow the global warming trend.

The student campaign was an outgrowth of an educational experiment sparked by two adults working for the Children's Earth Fund. According to one, Mary Daly, they were upset by the lack of environmental education teaching materials that included any practical citizen action, so they developed a curriculum about carbon dioxide and its impact on global warming. The curriculum was published in *Scholastic Magazine,* reaching thousands of children and their teachers.

It turned out that the children were concerned about the issue and eager to take part in both personal and political action. Students did most of the work from then on—studying the issue, examining U.S. policy, finding out how carbon dioxide emissions could be reduced.

Most of the student environmental groups had already started out as single-issue groups on other subjects. One group, Concerns About Kids' Environment of Freeport, Maine, fought styrofoam containers at McDonald's. It was instrumental in passing a town ordinance outlawing styrofoam containers in fast food restaurants. Many of the groups had already found major funding sources and were "going national" with membership drives. With help from Children's Earth Fund and several children's magazines, said Daly, it was not hard to unite the 15 groups into a coalition.

Together, they became an organization of children two million strong from California, Connecticut, Florida, Illinois, Maine, Maryland, Minnesota, New Jersey, New York, Oregon, Rhode Island, Tennessee, Texas, Washington, and Wisconsin, who called themselves, "The Kids World Council," and united under "The CO^2 Challenge."

Each member of the student coalition pledged to take personal action to reduce CO^2 emissions. The children also took political action by collecting signatures on petitions to send to the President of the United States. At the June 1992 United Nations Earth Summit international conference, they wanted him to commit the United States to reducing CO^2 levels as other industrial nations have pledged.

Personal and Political Actions

The students began their work in fall 1991, when they each pledged to cut back emissions of CO^2—the primary greenhouse gas—by one ton that year. Their pledges were specific, including such actions as planting a tree on the south or west side of a house (saves 150 pounds in air conditioning), doing more laundry in cold water (can save up to 400 pounds), and encouraging their parents to get the family car tuned up once a year (can save up to 900 pounds).

In February 1992, each group sent a representative to Washington, D.C., to take their political message to the President and members of the U.S. Senate. With the help of their advisors, they arranged a news conference, testimony before U.S. senators, and an attempt to deliver over 100,000 petition signatures to President Bush. Their State of the Earth address asked the U. S. government to take part in a four-part plan to reduce CO^2 emissions, including provisions to:

- Make producing pollution more expensive
- Require cars and trucks to get better gas mileage
- Save the Arctic National Wildlife Refuge from oil drilling
- Reward utilities for energy conservation

The students were forewarned that Bush was pretty busy the day they converged upon Washington—he was putting the final touches on his State of the Union address, to be given that night. The White House gatekeeper politely suggested that they take their petitions to the mail room. Instead, the students chose to drag the mailbags up to the Dirksen Senate Building, where they were scheduled to make a special presentation at the "Senate Special Children's Hearing on Global Warming" that afternoon.

There, in a packed hearing room, three small spokespersons delivered their message to the Senators. Before national network television cameras, radio microphones, and newspaper reporters and photographers, three children spoke. Their voices were heard across the country, including in their own hometowns.

Senator Gore's press secretary, Marla Romash, said later that the children made a strong impact. "Children are way ahead of adults on understanding the impacts of global warming. These children had a clear message, and delivered it very strongly. The Senators were very impressed."

Romash added, "Not only their presentation, but their entire effort can't help but have an effect." She urged other children to "get involved and stay involved."

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Master 10

Youth Activist Organizes Neighborhood for Wetlands

Andrew Holleman, of Chelmford, Massachusetts, spent much of his childhood exploring the woods and wetlands near his home. After growing to love the area's natural beauty, he often went home and read books that explained the ecosystem in which he lived.

When Andrew was 12 years old, he received a nasty shock in the form of a registered letter delivered to his mother. "It was from a developer saying he wanted to build a 180-unit condominium and that a meeting would be held at the town hall," recalled Andrew. "I read it and knew something had to be done."

His first destination was the local library. There he discovered the Hatch Act, a Massachusetts law protecting wetlands, and the town's Master Plan. He found that the proposed development would probably violate the wetlands law because the buildings would be on a wetland and be bordered by land reserved for conservation. Because of poor drainage in the area, the development would probably require an expensive sewage system.

Andrew took a week to write a detailed petition, explaining all his reasons for protesting the development. He then took to his feet, asking his neighbors to sign the petition.

"After three hours of walking, I would come back with five signatures and my mom would say, 'What happened?' Well, when somebody invites you in for a Coke and starts discussing it with you, it takes a while. A lot of people didn't seem to realize what was going on even though they also got a registered letter."

Before long, Andrew collected about 150 signatures. He got his sister, Elizabeth, and his parents to get signatures, too. He took copies of the petitions to the town hall, the selectman, the zoning commission, and the health board offices—all the people involved in the decision-making process.

After Andrew's conversations with petition signers, the audience for the scheduled town hall meeting grew to 250 people and had to be moved to the school gymnasium to accommodate the crowd.

Andrew got himself on the agenda to make a speech. "I was really nervous," he said. "We must have practiced my speech 40 times." When Andrew rose to speak, the audience clapped for a long time.

"My name is Andrew Holleman and I am 12 years old," he began. He explained how the condominium development would eventually pollute town wells because of the poor soil drainage and a stream running through the area into a large pond that feeds town wells. He talked about endangered species in the area—wood turtles, red fox, blue heron, and various hawks. Finally, Andrew made a suggestion for an alternative location—an abandoned drive-in movie lot in town. Even the developer admitted that Andrew, dressed in sneakers, jeans, and a sweatshirt, and holding the shell of a turtle, was a difficult image to overcome.

Meetings about the Russell Mill Pond development continued for some time. Andrew helped organize the Concord Road Neighborhood Association. "Each of us had our own specialized area. One person had access to printing so we printed all the bulletins. We had a chairman who did speaking for the group. My dad and I worked a lot with the conservation commission, but anybody else was free to work with them, too," Andrew explained.

"We asked for donations in our little bulletins. Members of the Association donated; people from the neighborhood donated, and so did people from places far away. We raised $16,000. We hired a lawyer and an environmental scientist. The group videotaped wetlands and areas of excessive drainage, proving that drainage of a development would be poor."

Eventually, the Massachusetts Department of Environmental Quality went to the proposed site and tested the soil and groundwater, which confirmed Andrew's predictions. "I was excited and relieved," he recalls.

The town denied a comprehensive permit to the developer for the condominium project. The developer took Andrew's suggestion and built the project the project in the drive-in area.

Joseph Shanahan, attorney and developer for the Russell Mill Pond Realty Trust, Inc., gave this tribute to Andrew: "I was bucking heads with Andrew and his group for 11 months. For a youngster, he did a heck of a job organizing the community."

Others have recognized Andrew's hard work, too. Andrew became the youngest winner of the U.S. Environmental Protection Agency's Regional Merit Award. He also received the United Nations Environmental Programme 1989 Global 500 Award for Achievement.

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Master 11

Superbarrio: A Mexican Superhero

In the aftermath of the Mexico City earthquake of 1985, hundreds of thousands of earthquake victims and non-victim poor joined to create a remarkable movement that forced the government and the World Bank to greatly accelerate the process of housing reconstruction.

Within days of the quake, a coalition of organizations formed, successfully uniting earthquake victims and scores of neighborhood organizations. Through deft manipulation of the media and political bartering, the coalition pressured and forced the government into major residential construction programs and other concessions—and then maintained unrelenting pressure to force compliance with what had been promised. Whenever the Mexican government dragged its feet, renewed pressure was applied. In May 1986, for example, the coalition announced that tens of thousands of still-homeless victims would link hands around Aztec Stadium during the internationally televised World Cup Soccer championship. This action was called off only at the last minute when a crash construction program began to show visible results. Eventually, 50,000 units were constructed and another 40,000 units were repaired, more or less on time and approximately within budget.

The earthquake demonstrates the galvanizing force of a natural disaster. But in the aftermath—with the relative success of the reconstruction program—the political energy of the movement waned. It was recaptured not by another natural event, but by a man made media event: the creation of a popular hero named Superbarrio.

Superbarrio was not an identifiable individual, but a masked wrestler, a good guy sworn to oppose the bureaucracy: the greedy landlord, the party political hacks, and the state. Dressed in yellow tights, red cape, and SB-emblazoned superhero's mask, Superbarrio led tens of thousands of people in street protests over renters' rights, housing codes, credit for housing construction, and the pace and scale of the government's low-cost housing program. Superbarrio was said to lose his super strength when his mask was removed or when he was out of the sight of the people. Because of this, he forced embarrassed public officials to negotiate in public—in front of television reporters or on the street in front of cheering crowds.

Superbarrio enlivened Mexican popular politics with audacity and humor. In August 1987, for example, he announced he would wrestle his archenemy, a tightfisted greedy landlord—in front of the National Cathedral. The government angrily rejected the unseemly location for a wrestling match. The government's willingness to allow the match at all (and if so, where) became a media event in itself. After suffering innumerable political lampoons, the embarrassed government finally reluctantly agreed to let the match be held behind the cathedral. The wrestling ring was set up, but it mysteriously disappeared in the wee hours of dawn before the scheduled match. This prompted taunts, accusations of fraud and government theft, and new street protests.

By creating a good-natured media hero who symbolized the popular struggle and who could not be bribed (and was therefore trusted by the people), the behind-the-scenes barrio associations managed to create considerable excitement, a shared pool of knowledge, and a formidable political force.

But Superbarrio was more than street theater. He reflected the popular movement's growing capacity to put information, not just symbolism, to use. At that time, one tactic of the barrio associations was to force the president of Mexico to negotiate publicly through open letters that appeared in the press. The letters recounted meetings and promises made by housing officials. The government was confronted by barrio groups aggressively demanding a new round of low-cost housing construction and expropriations of properties belonging to landlords who evaded taxes and ignored housing regulations.

The government claimed, first, that the housing needs of most victims were being successfully met, and second, that no building sites were available in the earthquake zones for more low-cost contruction. But the barrio groups proved the government wrong. With a personal computer, they created an up-to-date database of 20,000 unserved earthquake victims and homeless families. They also obtained a database of properties which, because of health and building code violations and property tax delinquency, were eligible for expropriation. Armed with information and the means to publicize it, the barrio associations were in a position to argue that these central city properties were being held solely for speculation and that they should, instead, be expropriated by the state to provide buiding sites for the second phase of the National Reconstruction Program.

The media guerilla Superbarrio generated not just barbs, but public debate over serious issues.

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Master 12

Success Story Discussion Questions

–What motivated the individual or group in this story to take action?

–What types of action did they undertake?

–What barriers and challenges did they face?

–How did they overcome these barriers?

–Do you know stories where people faced a similar challenge?

Section 9

The Action Matrix: a Tool For Analyzing Issues

A systematic approach to discovering the range of possible solutions to environmental problems. Can be done in large groups with one facilitator or in small groups.

Objective
To use and understand a tool for analyzing environmental actions.

Materials
Examples or one handout from Master 9, 10, or 11; handouts from Masters 13 and 14.

Time: **45 minutes**

Outline

1

Introduce the action matrix as a tool for analyzing environmental actions and outline some of its advantages (Master 13). The matrix provides a framework of options for taking action; in this activity, teachers will complete the matrix while thinking about one story or case.

2

Ask the group: "Who (people or groups) in the community can help solve environmental problems?" List their suggestions on the board, organizing their responses into four categories: individuals, organizations, government agencies, and business. These of "problem solvers ' form the vertical axis of the matrix (see Master 14).

3

Distribute copies of the Action Matrix and explain that the problem solvers don't usually take action on their own; they tend to be "motivated" by other government agencies, individuals, groups, and businesses—the same categories as those who solve problems. Point out the labels on the Matrix; the "motivators" run across the top of the matrix. The participants' task will be to generate strategies or examples that fit into each of the cells—examples of how motivators prompt action-takers to solve problems.
For example:

- Cell 2 (organizations are motivating individuals): an organizational letter writing campaign directed at members to act.
- Cell 9: individuals press their representatives for legislation.
- Cell 15: a state resource agency fines a company.
- Cell 13: stockholders vote to require a company to use recycled paper.

4

Distribute copies of an environmental success story and ask participants to read the article, then work in small groups to complete the matrix. (Use Master 9, 10, or 11, or your own example from another source.) Encourage the groups to identify all of the actions from the example and describe them in the appropriate cell. In contrast, you could give each group a different story and aks them to fill in their matrix.

5

As they complete their assignments, ask the small groups to consider the empty cells, and generate ideas for additional actions that might be taken. The resulting "completed" matrix can be used to analyze real examples or strategize about how a problem might be solved. Point out that students who feel hopeless about solving environmental problems may see in the matrix several options for action they could reasonably take. Students may find the matrix useful as a tool for analyzing cases and stories they read about solving environmental problems.

Master 13 Using the Action Matrix

The Action Matrix has been very successful at helping teachers explore possible action taking strategies. The matrix can be used with success stories to analyze the ways environmental problems have been addressed by others; it can be a tool for comparing several case studies; and it can help students evaluate the available options as they contemplate their own environmental problem.

The vertical axis of the matrix lists categories of people and organizations that "solve" environmental issues. Since these parties don't usually take action on their own, but are prompted to action by other forces or events, the horizontal axis lists the same parties as "motivators." The matrix is filled with examples of actions the motivators use to prompt action from the problem solvers. For example, "students writing letters to a decision-maker" could be a possible entry for the cell at the intersection of individual motivators and government problem solvers (cell 9). If the students' letters were encouraged by an environmental organization's newsletter, then you could write "providing information" in the cell at the intersection of environmental group-motivators and individual-problem solvers (cell 2).

Possible Uses of the Matrix

Filling in the cells:
Simply completing the matrix can give students a sense of the diversity of possible actions—many of them ones they take for granted (e.g., reading the paper, talking to people, being fined for breaking a law). While students may be able to generate quite a few strategies on their own, you may find using a variety of case studies will provide them with enough imagery to fill in all the cells.

Developing an action strategy:
Students can use this matrix to plan their own approach to an issue. It can help them decide what parties they want to influence. Again, you may find providing students with ideas that others have tried will help them see a number of different approaches and recognize how issues become very connected.

Mapping specific cases:
Working from case studies, students can distill an approach into specific actions, mapping the strategies that produced the described outcome. This can help students realize that environmental issues are not solved by just one action or one party. Rather, solutions are a sequence of actions which build on one another. Most environmental successes are a combination of small, discrete steps.

Analyzing the dynamics of action:
Students may discover some gaps in their matrix indicating strategies or actions that were not taken. The group can discuss potential barriers and advantages to the actions they've identified so that students can begin to think about what does or doesn't work and why.

Master 14 The Action Matrix

Problem Solvers	Motivators			
	Individuals	Environmental Organizations	Government	Business
Individuals	1	2	3	4
Environmental Organizations	5	6	7	8
Government	9	10	11	12
Business	13	14	15	16

Resources

Trainer, Skill Building, and Background References

Conflict Mangers Training Manual for Grades 3–6 and ***Classroom Conflict Resolution Training for Elementary Schools***, 1987. San Francisco: The Community Board Program, Inc. Together, these two guides provide students and teachers with all they need to set up a student-based conflict resolution program at the elementary level. A conflict resolution process is included as well as activities for practicing the skills. This organization also offers excellent materials and training sessions for students and teachers at the high school level and for the general public.

The Community Board Program, Inc
149 Ninth Street
San Francisco CA 94103
✆ 415 552-1250

Creative Conflict Resolution. William J. Kreidler, 1984. Glenview, IL: Scott, Foresman and Company. One of the best resources for K-6 teachers. It contains more than 200 activities in such areas as understanding conflict, resolving student versus student conflicts, improving communication skills, teaching tolerance, and helping students handle anger, frustration, and aggression.

Creative Conflict Solving for Kids. Fran Schmidt and Alice Friedman. 1985. Miami, FL: Grace Contrino Abrams Peace Education Foundation, Inc. One of the most useful parts of this guide is the "rules for fighting fair." The rules provide a framework for students to use in order to resolve conflicts and disagreements. It is designed for grades 4-9.

Ecological Literacy: Education and the Transition to a Postmodern World. David W. Orr. 1992. Albany, NY: State University of New York Press. The first section of the book looks at issues of sustainability and the limits of earth's resources. The second part focuses on education, raising questions and answers about what people should know and how they should learn it, given those limits.

Environmental Problem Solving: Theory, Promise, and Possibilities. Lisa Bardwell, Martha C. Monroe, and Margaret Tudor. 1994. Troy, OH: North American Association for Environmental Education. This NAAEE Monograph includes theoretical considerations, models from leading environmental educators, descriptions of programs that practitioners find successful, and sample activities to build problem-solving skills. It is available from:

NAAEE
P.O. Box 400
Troy OH 45373
✆ 513 676-2514

Getting Started: A Guide to Bringing Environmental Education Into Your Classroom. David Bones, ed. 1994. National Consortium for Environmental Education and Training. A sourcebook of ideas, organizations, curricula, and programs in environmental education with short stories about classroom teachers and how they conduct environmental education programs in their schools. Available for $9.95 from:

NCEET
University of Michigan School
of Natural Resources and Environment
430 East University
Ann Arbor MI 48109-1115
✆ 313 998-6726
Fax: 313 936-2195

Getting to Yes: Negotiating Agreement Without Giving In. Roger Fisher and William Ury. 1981. New York: Penguin Books. One of the first books on the popular market to help people develop negotiation and conflict-resolution skills. Eminently readable.

Global Teacher, Global Learner. Graham Pike and David Selby. 1988. London: Hodder and Stoughton. A thorough and readable treatment of activities and ideas for enhancing student learning and problem-solving abilities, adapting curricula, and altering the classroom environment.

A Handbook of Structured Experiences for Human Relations Training. W. Pfeiffer and J. Jones, 1972, and ***Human Resource Development*** **Set.** J. William Pfeiffer, 1987–93. San Diego: Pfeiffer and Company. A wide range of games and activities for use in groups and training situations. Includes activities for problem solving, conflict management, and teambuilding. Arranged to aid facilitators; exercises are easily adaptable, with excellent instructions. The set now includes 22 volumes with more than 250 structured experiences. Written primarily for adult professional development training. To order, contact:

Pfeiffer and Company
8517 Production Avenue
San Diego CA 92121-2280
✆ 800 274-4434

"The Liberal Arts, the Campus, and the Biosphere." David W. Orr. ***Harvard Educational Review***, 60:2 May 1990, pp. 205–216. What impact does the campus have on the biosphere? What role should universities play in the struggle to live sustainably? Orr provides a rationale for incorporating environmental concerns into the curricula of higher education and examples of curricular innovations.

"Strategic Questioning: For Personal and Social Change." Fran Peavey. 1994. ***By Life's Grace.*** New Society Publishers, Philadelphia. A short pamphlet by a well-known social activist that focuses on communications and its role in effecting social change. She presents what she calls "communication of a second kind"—communication that explores what we could be and creates information rather than communicating what is already known. To arrange a one- or two-day workshop, contact:

Fran Peavey
3181 Mission St. #30
San Francisco CA 94110
✆ 510 428-0240
Fax: 510 601-5683

Transforming Power: Domination, Empowerment, and Education. Seth Kreisberg. 1992. Albany, NY: State University of New York Press. This book explores empowerment, the process through which people develop more control over their lives and acquire the skills necessary to be critical and effective participants in society. It includes a useful model of empowering education.

Resources for Exploring Issues

E2 (formerly known as "The EarthTime Project"). A curriculum that encourages junior and senior high school students to use the school as a study site to explore resource use and waste (energy, water, food, pesticides, etc.).

E2
881 Alma Real Drive, Suite 118
Pacific Palisades CA 90272
✆ 310 573-9608

Environment. John L. Allen, ed., 1993. Dushkin Publishing Group, Guilford, CT: An annual publication featuring opposing pairs of environmental articles for discussion and debate originally published in a wide range of periodicals. It includes a short primer on environmental information retrieval and lists selected phone numbers and addresses for government agencies, citizen organizations, and journals. Instructor's guide available.

The Environment, Tom Snyder Productions, Inc. Computer simulation that engages students in making decisions about landfill siting, water pollution, and other issues in the community. Role playing as the mayor of Alpine, students evaluate the arguments of science and policy advisors and try alternative solutions to environmental problems. A similar kit, ***Urbanization,*** addresses development issues. Available from:

Tom Snyder Productions, Inc.
80 Cooledge Hill Road
Watertown MA 02172-2817
✆ 800 342-0236

Investigating and Evaluating Environmental Issues and Actions. Harold R. Hungerford, Ralph A. Litherland, R. Ben Peyton, John M. Ramsey, Audrey N. Tomera, and Trudi L. Volk. 1985. Champaign, IL: Stipes Publishing. A series of modules and activities that develop students' skills in investigating and evaluating problems.

National Geographic Kids Network. The Kids Network is a computer and telecommunication-based science program for upper elementary and middle school students. Classrooms gather scientific data on their topic and use computers to analyze the data and share it with classrooms around the world. The seven programs cover such topics as water use, acid rain, food, and weather. Includes teacher background information, student materials, activity ideas, and software.

National Geographic Society
Educational Services
P.O. Box 98018
Washington D.C. 20090-8018
✆ 800 368-2728

The No Waste Anthology: A Teacher's Guide to Environmental Activities K–12. California Department of Health Services. A collection of activities from 20 sources that focuses on natural resources and pollution, solid waste, and hazardous waste.

Toxic Substances Control Department
California Dept. of Health Services
P.O. Box 942732
Sacramento CA 94234-7320
✆ 916 322-0476

Pollution: Problems and Solutions. NatureScope,® 1990. A valuable set of activities and background information to help K–8 students understand issues associated with water, air, and land pollution. Includes "copycat" pages and resource lists. Available from:

National Wildlife Federation
1400 16th Street NW
Washington D.C. 20036-2266

Taking Sides. T.D. Goldfarb. 1993, Dushkin Publishing Group, Guilford, CT: An annual publication that pairs opposing views of environmental issues from popular periodicals. Includes instructor's guide.

Resources for Understanding Solutions

Energy Options: Finding a Solution to the Power Predicament and ***The Environment at Risk: Responding to Growing Dangers.*** These two issue books come from the National Issues Forum and are available from Kendall/Hunt Publishers (800 258-5622). Additional information is available from:

The Kettering Foundation
200 Commons Road
Dayton OH 45459
✆ 513 434-7300

Additional materials are also available from:

The Study Circles Resource Center
PO Box 203, Route 169
Pomfret CT 06258
✆ 203 928-2616

Environmental Success Index. Renew America. The Index is published annually and lists more than 1,600 programs of innovative solutions to environmental problems. Includes contact names, addresses, and phone numbers. Available from:

Renew America
1400 Sixteenth Street NW, Suite 710
Washington D.C. 20036
✆ 202 232-2252

Solid Waste Mess: What Should We Do With The Garbage? and ***The Wetlands Issue: What Should We Do With Our Bogs, Swamps And Marshes?*** As a part of the Environmental Issues Forum, these issue books are produced by the North American Association for Environmental Education. You can order books from:

NAAEE
P.O. Box 400
Troy OH 45373
✆ 513 676-2514

Information on EIF and moderator training is available from:

NAAEE
1255 23rd Street NW, Suite 400
Washington DC 20037
✆ 202 884-8914

"Success Stories: Imagery by Example." Lisa Bardwell. 1991. ***Journal of Environmental Education*** 23(1); 5–10.

The Success Story Primer: Using Stories to Explore Environmental Issues. Linda Manning and Lisa Bardwell. 1994. National Consortium for Environmental Education and Training, Ann Arbor, Michigan. This guide for teachers will provide several strategies for using stories in classroom teaching and for accessing useful articles. For information on availability, contact NCEET by calling 313 998 6726.

Wall Street Journal Classroom Edition. Often covers end issues. Includes a teacher's guide with lesson plans, and activities as well as Spanish translations of key articles. Contact the Wall Street Journal at 800 628-9320.

What Works #1: Air Pollution and Solutions; What Works #2: Local Solutions to Toxic Pollution. Developed by The Environmental Exchange. Two books on successful grassroots efforts related to air pollution and toxics. Well-written and documented case studies and success stories with contact information. To order copies, contact:

Public Interest Publications
P.O. Box 229
Arlington VA 22210
✆ 800 537-9359

"When Words Speak Louder Than Actions." M.C. Monroe and S. Kaplan. 1988. *Journal of Environmental Education* 19(3):38-41.

Resources for Making it Happen

The Action Research and Community Problem Solving Manual. William B. Stapp, et al. 1994. Discusses the theory behind an action research and empowerment model of teaching problem-solving skills. Includes several classroom case studies and a step-by-step guide for beginning a similar program. For information contact:

GREEN
721 East Huron
Ann Arbor MI 48104
✆ 313 761-8142

Field Manual for Water Quality Monitoring. Mark Mitchell and William Stapp, 1985. Dexter, MI: Thomson-Shore. Available from:

GREEN, the Global Rivers Environmental Education Network
721 East Huron
Ann Arbor, MI 48104
✆ 313 761-8142.

Involving Students in Environmental Action Projects: An Educator's Guide. Darlene Stoner. 1994. Western Regional Environmental Education Council, Inc. Intended for educators of grades 5-12, this guide will enable teachers to help their students translate interest in wildlife and environmental concerns into environmental action projects. Contents include: rationale and educational benefits, hints for facilitating student efforts; suggestions for assessment, and a thorough description of a diverse action projects undertaken by students and teachers across the country. To be published in fall 1994.

Project WILD
5430 Grosvenor Lane
Bethesda MD 20814
✆ 301 493-5447

The Kid's Guide to Social Action. Barbara A. Lewis. 1991. Minneapolis: Free Spirit Publishing. Examples, skills, and concrete suggestions for exploring local issues and taking action.

Training Student Organizers Curriculum. Michael Zamm, Robert Ortner, and Beverly DeAngelis. 1990. Trains students to organize environmental improvement projects in schools and neighborhoods. Available from:

Council on the Environment of NYC
51 Chambers Street, Room 228
New York NY 10007
✆ 212 788-7900.

Organizations

Center for Conflict Resolution
731 State St.
Madison WI 53703
✆ 608 255-0479
Offers resources that focus on cooperative games, peace education, and others for teaching kids how to resolve interpersonal conflicts in the schoolyard.

Educators for Social Responsibility
23 Garden Street
Cambridge MA 02138
✆ 617 492-1764
This organization publishes and sells a large variety of informational and curricular resources for K–12 teachers on such topics as conflict resolution, conflicts about trash disposal, and the use and misuse of math in statistical analysis of issues.

FutureMakers Inventor Mentor Program
Oregon Graduate Institute of Science & Technology
19600 NW von Neumann Dr.
Beaverton OR 97006
✆ 503 690-1190
This interdisciplinary program promotes development of critical thinking, problem-solving, and teamwork skills. Although the focus of this specific program is on partnerships between schools and businesses, the activities are as applicable to environmental issues. Features Eberle's SCAMPER as a model to encourage students to play with ideas.

Grace Contrino Abrams Peace Education Foundation
P.O. Box 19-1153
✆ Miami Beach FL 33119
Has many publications on conflict resolution skills that may be useful to teachers.

National Center for Teaching Thinking
P.O. Box 334
Newton Center MA 02159
✆ 617 965-4604
Offers excellent resources, materials, activities, consulting, and training that infuse the teaching of thinking into content instruction. Sample courses include "Helping Students Think About Controversial Issues" and "Teaching Skillful Decision Making and Problem Solving in Content Instruction."

GREEN
721 East Huron
Ann Arbor MI 48104
✆ 313 761-8142
GREEN is a non-profit organization that seeks to improve education through a global network that promotes watershed stewardship. GREEN supports watershed education programs through educational materials, teacher training workshops, the *GREEN* newsletter, international computer networking, the Cross-Cultural Partners Program, and formal and informal partnerships.

Endnotes

1 These ideas are derived from the work of two Australians, A. Reid and B. Moore, and are referred to in *Education for the Environment: Critical Curriculum Theorizing and Environmental Education* by John Fien. (Brisbane: Deakin University and Griffith University, 1992)

2 M.C. Monroe and S. Kaplan, 1988 "When Words Speak Louder Than Actions," *Journal of Environmental Education* 19(3):38–41.

3 Harold R. Hungerford, Ralph A Litherland, R. Ben Peyton, John M. Ramsey, Audrey N. Tomera, and Trudi L. Volk, *Investigating and Evaluating Environmental Issues and Actions*. (Champaign, IL: Stipes Publishing, 1985)

4 Lisa Bardwell, Martha Monroe, and Margaret Tudor, eds., *Environmental Problem Solving: Theory, Practice, and Possibilities*. (Troy, OH: NAAEE, 1994)

5 Guidelines are taken from two excellent resources: *Creative Conflict Solving for Kids* by Fran Schmidt and Alice Friedman and *Creative Conflict Resolution* by William Kroidler. Both are listed in the "Resources" section above.

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